REPORT TO THE LEGISLATURE

PREPARED BY:
SELECT COMMITTEE ON SCHOOL FINANCE RECALIBRATION

JANUARY 2016

SELECT COMMITTEE ON SCHOOL FINANCE RECALIBRATION

2015 RECALIBRATION OF THE EDUCATION RESOURCE BLOCK GRANT MODEL

JANUARY 2016

INTRODUCTION

Pursuant to Wyoming Statute 21-13-309(t), recalibration of the education resource block grant model (ERBGM) was conducted over the course of the 2015 interim. The Select Committee on School Finance Recalibration (Select Committee) was established pursuant to 2015 Wyoming Session Laws, Chapter 142, Section 343 and met for twelve meeting days to perform this work.[1] The Select Committee was largely guided by the findings and recommendations contained in the Desk Audit, dated January 15, 2015, prepared by Dr. Larry Picus and Dr. Allan Odden of Picus Odden and Associates, consultants under contract with the Wyoming Legislature. ***See Appendix A.*** In accordance with the recommendations contained in the Desk Audit, the Select Committee undertook a comprehensive recalibration effort, reviewing thirty-eight separate elements related to the ERBGM and school finance. The funding implications associated with statewide preschool and school safety and security, more specifically the employment of school resource officers, were reviewed by the Select Committee.

A final report titled "2015 Wyoming Recalibration Report" was prepared for the Select Committee, by Picus Odden and Associates, dated November 2015. Within the final report a summary table found on pages fourteen through thirty-five depicts the model elements as calculated under the 2010 and 2015 evidence-based recommendations, the model allocations under current law and cost differences between the 2015 evidence-based recommendations and current law for each element. The remaining pages of the final report contain the detailed recommendations and analysis of the work reviewed and performed by Picus Odden and Associates at the direction of the Select Committee. This report and the findings therein were adopted by the Select Committee as a representation of the work over the course of the 2015 interim in conducting recalibration of the ERBGM. ***See Appendices B and C.***

TEACHING AND NON-TEACHING PERSONNEL

The work of the Select Committee included an in-depth review of salaries and the labor market associated with the provision of K-12 public education in Wyoming. Dr. Christiana Stoddard, from Montana State University, and Picus Odden and Associates assisted the Select Committee in review of this element. The report titled "Teacher and Non-Teacher Labor Markets in Wyoming" prepared by Dr. Christiana Stoddard for the Select Committee represents the analysis and findings of the Select Committee upon conclusion of the 2015 recalibration effort in relation to teacher and non-teacher salaries. ***See Appendix D.*** Analysis of the teacher and non-teacher salaries as contained in the current ERBGM (model salaries), as well as school district salary data collected by the Wyoming Department of Education and other entities, was

[1] The dates of the meetings and the locations were: May 21 & 22 (Casper), June 29 & 30 (Cody), August 6 & 7 (Casper), September 2 & 3 (Casper), October 1 & 2 (Casper) and November 16 & 17 (Casper).

conducted.[2] The goal of this portion of the study was to determine if salaries within the ERBGM and actual salaries for school personnel are sufficient to allow school districts to attract and retain high quality employees and thus, adequately reflect the "cost" associated with the personnel necessary to deliver the basket of educational goods and services. It was concluded the model salaries for teachers are at the top of regional salaries and allow school districts to recruit teachers from many surrounding states and maintain very low turnover rates. It was further concluded, the model teacher salaries allow school districts to provide highly competitive wages at a national level. The study also found teacher salaries are high relative to comparable professions, at ninety-four percent of the wages of other Wyoming professional and technical workers, with the national average and surrounding states paying between seventy-five and eighty percent. It was also concluded Wyoming increasingly recruits teachers from out of state, with seventy percent of new hires coming from other states in 2014. However, the data indicates a rise in degrees from online programs and does not support that these teachers are from better institutions than in the past. Continued monitoring of this aspect was recommended within the report.

As noted, the work included review of non-teaching wages and labor market trends. This analysis focused on review of comparative average annual wages for related occupations and trends in turnover rates.[3] For comparison purposes, non-teaching professions were grouped into the following categories: 1) school and central administration; 2) professional staff; 3) secretarial/clerical staff; 4) other classified staff; and 5) supervisory aides. In relation to the highest level administrators, the data indicates the model salaries are lower than comparable professions in private and public sectors. However, actual salaries for superintendents, assistant superintendents and business managers are comparable to those paid in other markets. The actual salaries of these individuals exceed the model by approximately twenty percent. The model salaries for principals rank Wyoming in the middle of the distribution of neighboring states and actual salaries are closer to the market and three percent higher than the next highest paying neighboring state. The findings of the report include that other professional staff, those requiring a college degree, such as librarians, counselors, psychologists, social workers and nurses, receive salaries comparable to the market. The conclusions also indicate secretarial and clerical workers are paid slightly more than the model salaries and actual salaries are in line with the market. Analysis of the aide position proved somewhat difficult, as most school districts make hiring decisions significantly different than the model in this regard. Districts routinely hire instructional aides, as opposed to supervisory aides as allocated by the model and there are not clear counterparts to these positions outside the structure of public education. That said, it was concluded relative to other support services, aides are highly paid.

REGIONAL COST ADJUSTMENT

The Select Committee, with the assistance of Dr. Lori L. Taylor and Picus Odden and Associates, undertook a comprehensive analysis of the regional cost adjustment as well. The report titled "Options for Updating Wyoming's Regional Cost Adjustment" was prepared by Dr. Lori L. Taylor for the Select Committee and was adopted by the Select Committee as a representation of the work and analysis conducted relative to this element over the course of the 2015 recalibration. ***See Appendix E.*** The regional cost adjustment is utilized to adjust personnel costs contained in the model for cost differences associated with geographic location. Wyoming is one of twelve states that adjust its school funding formula to reflect regional cost differences. Currently, the regional cost adjustment consists of a three

---

2 Additional data sources reviewed in analysis of teacher salaries include: U.S. Department of Labor, Occupational Employment Statistics; American Community Survey; the Digest of Educational Statistics; and National Education Association reports.

3 Data sources reviewed in analysis of non-teaching salaries include: Wyoming Department of Workforce Services survey of employers in Wyoming; Occupational Employment Statistics Survey; and the Wyoming Department of Education Fall staffing files.

pronged approach: the higher of the Wyoming Cost of Living Index[4], the 2005 Hedonic Wage Index or 100 (the statewide average). Dr. Taylor conducted a robust analysis of the current approach utilized by Wyoming and the indices associated with the adjustment. The conclusions include the current approach, whereby two indices are utilized and no district is below the statewide average, narrows the range of the geographic cost adjustment, greatly reduces the ability of the geographical cost adjustment and greatly diminishes the ability of the regional cost adjustment to equalize purchasing power among the school districts. The evidence-based recommendation was to move to one index, a comparable wage index utilizing data from the Occupational Employment Survey. It was stated such an index is beyond the control of the school district influence, eliminating the risk the adjustment would misidentify high spending districts as high cost districts, and would reflect regional difference in cost of living and differences in local amenities. Lastly, the information received includes a recommendation to regularly update the regional cost adjustment, regardless of the index or indices chosen, to ensure the model remains an accurate reflection of the cost differences between school districts over the course of time.

EXTERNAL COST ADJUSTMENT

The Select Committee also reviewed the indices and the appropriateness of the process utilized by the Legislature and the Joint Education Committee each year in determining the necessity of an external cost adjustment. Dr. Lori L. Taylor and Picus Odden and Associates assisted the Select Committee in this effort. The report titled "External Cost Adjustments for the Wyoming School Funding Model: 2015" was prepared by Dr. Lori L. Taylor for the Select Committee and was accepted as a representation of the work undertaken during the 2015 recalibration effort in relation to the external cost adjustment. ***See Appendix F.*** In 2012, the Legislature adopted a monitoring process to determine if cost pressures exist on various elements of the model and to determine the appropriateness of application of an inflationary adjustment via an external cost adjustment. The monitoring process includes review of four indices, one for each of the following model categories: professional staff resources, non-professional staff resources, utilities and educational materials. Because the statutory model provides resources in excess of the evidence-based model, the appropriate inflationary factors have been applied to the evidence-based model to ensure the appropriate cost is maintained. This approach was validated by Dr. Taylor and Picus Odden and Associates during the 2015 recalibration and it was recommended this practice continue in relation to application of an external cost adjustment. A slight modification was suggested in relation to the index utilized to adjust the utility component of the model, to include the producer price index for gasoline in the composite energy price index along with commercial electricity and commercial natural gas.

PUBLIC AND STAKEHOLDER INPUT

The Select Committee engaged in significant efforts to obtain stakeholder and public input during the 2015 recalibration. In addition to the traditional public testimony taken after each item on the agenda and the public comment feature available on the Legislative Service Office’s (LSO) website, the Select Committee sought input through additional means.[5] At the May 21 and 22, 2015 meeting of the Select Committee, the LSO staff was directed to collect input from school district board members and superintendents on salary pressures experienced by school districts. In response to this charge, the LSO staff worked with the Wyoming School Boards Association and the Wyoming Association of School Business Officials to gather the requested information, which was then presented to the Select Committee. In addition, the Select Committee charged Picus Odden and Associates with engaging the public and stakeholders in a dialogue on two specific topics: 1) educational strategies utilized by schools and school

[4] The Wyoming Cost of Living Index used is the average of the last six consecutive semi-annual index reports completed by January 1 of the immediately preceding school year.
[5] The minutes for each Select Committee meeting, as contained on LSO's website, include a summary of the testimony given by members of the public and stakeholders in attendance.

districts to improve student performance and interventions to assist struggling students; and 2) budget implications and concerns in relation to the operation of the statutory and evidence-based models. Picus Odden and Associates held two meetings on July 1 and 2, 2015 to undertake this discussion. Both meetings were widely attended by members of the public and educational stakeholders from across the state. The comments received and the proceedings of the stakeholder meetings were summarized by Picus Odden and Associates and presented to the Select Committee for consideration. Lastly, in addition to individual stakeholders providing comments, several districts formed working groups on various issues and submitted "white papers" on specific elements of the ERBGM to the Select Committee that were also considered over the course of the 2015 recalibration.[6]

CONCLUSIONS AND SELECT COMMITTEE FINDINGS

The Select Committee submits the following findings and recommendations for the consideration of the 2016 Legislature as a result of the recalibration of the ERBGM over the course of the 2015 interim. Upon conclusion of the recalibration effort, the Select Committee determined draft legislation was not necessary. The Select Committee recognized and accepted the work and final reports of the various consultants employed for the purpose of conducting the recalibration. The Select Committee concluded the resources pursuant to the 2015 evidence-based recommendations, in total, are less than the total allocation of resources provided pursuant to operation of the 2015 statutory model. In total, the 2015 evidence-based model would provide an estimated $50.4 million less than the 2015 statutory model. ***See Appendix G.*** The Select Committee further recognized based on the public and stakeholder testimony over the course of the interim, school districts and stakeholders were not supportive of a model with the 2015 evidence-based recommendations embedded, requesting the Select Committee and the Legislature continue to allocate resources pursuant to the 2010 cost of education studies and the resources provided statewide to school districts under the 2015 statutory model. Pursuant to the public and stakeholder input, and in light of total resources allocated by the 2015 statutory model, the Select Committee makes the following findings and recommendations:

1) The 2015 cost of education studies performed pursuant to 2015 Wyoming Session Laws, Chapter 142, Section 343 satisfy the requirements under W.S. 21-13-309(t) to perform a recalibration of the education resource block grant model not less than once every five (5) years.

2) The 2015 cost of education studies are accepted as determining an allocation of resources that in total, would provide sufficient funds to each school district in the state to adequately provide the basket of educational goods and services required to be delivered to meet the State’s duty under the Wyoming Constitution to provide an education to Wyoming students, even though that allocation provides less funds to districts than the statutory model utilized to determine the school foundation program guarantee under W.S. 21-13-309(p), plus amounts provided under W.S. 21-13-334 and 21-13-335, for school year 2015-2016.

3) The allocation of resources contained within the 2015 cost of education studies can be delivered with the total resources allocated by the statutory model utilized to determine the school foundation program guarantee under W.S. 21-13-309(p), plus amounts provided under W.S. 21-13-334 and 21-13-335, for school year 2015-2016.

[6] Whitepapers were submitted in relation to the following elements of the model and evidence-based recommendations: the regional cost adjustment, teacher salaries, equipment and technology, the small district funding adjustment, student activities, school resource officers and school security and food services.

4) The statutory model utilized school year 2015-2016 to determine the school foundation program guarantee under W.S. 21-13-309(p), plus amounts provided under W.S. 21-13-334 and 21-13-335, generates more total resources than the 2015 cost of education studies would and allocates those resources in a manner that meets the State's duty under the Wyoming Constitution to provide an education to Wyoming students.

5) As a result of public input and testimony, over the course of the 2015 interim and specifically at the November 15 and 16 meeting of the Select Committee, not a single district or person in attendance supports moving to a funding model incorporating the evidence-based recommendations.

6) The evidence-based recommendations are no more likely to reflect the method of delivery of educational services in Wyoming's schools, than those services delivered with the resources provided by the current statutory model.

7) There is substantial benefit to continuing to fund schools via the statutory model by providing consistency in the funding for school districts.

8) In many instances the various evidence-based models to reallocate resources, as proposed by consultants, lacks sufficient research and data to warrant a new allocation of resources in comparison to the existing statutory model.

9) The statutory model for school year 2015-2016 continue to be utilized to allocate resources to Wyoming school districts pursuant to the current statutes and no modifications be made to the operation of the statutory model utilized to allocate resources for school year 2015-2016.

10) The Joint Education Interim Committee may review the regional cost adjustment methodology, and accompanying data, every two years in even numbered years of budget session.

11) The current statutory model delivers the basket of educational goods and services and fulfills constitutional mandates related to education and the legislative grace as contained in the current statutory model satisfies legislative goals.

APPENDICES

A. *Desk Audit of the Wyoming School Funding Model*, prepared for the Wyoming Legislature, by Picus Odden and Associates, dated January 15, 2015;

B. *2015 Wyoming Recalibration Report*, prepared for the Select Committee on School Finance Recalibration, by Picus Odden and Associates, dated November 2015;

C. *2015 Wyoming Recalibration Report: Addendum*, prepared for the Select Committee on School Finance Recalibration, by Picus Odden and Associates, dated January 2016;

D. *Teacher and Non-Teacher Labor Markets in Wyoming*, prepared for the Select Committee on School Finance Recalibration, by Dr. Christiana Stoddard, dated October 1, 2015;

E. *Options for Updating Wyoming's Regional Cost Adjustment*, prepared for the Select Committee on School Finance Recalibration, by Dr. Lori L. Taylor, dated October 2015;

F. *External Cost Adjustments for the Wyoming School Funding Model: 2015*, prepared for the Select Committee on School Finance Recalibration, by Dr. Lori L. Taylor, dated October 2015;

G. *Estimated Cost Difference between Evidence-Based Model and Statutory Model School Year 2015-2016*, prepared by the Legislative Service Office.

File Storage: F:\SchoolFinance\SCHOOL 2016\Select Recalibration\2016 01 12 Recalibration Findings.docx

May 26, 2015: The version of the report is identical to the January 15, 2015 version with the following exceptions: a) a corrected Table 3.1 for Model Element 10 and b) a corrected table for historical Model health insurance amounts for Model Element 34.

DESK AUDIT OF THE WYOMING SCHOOL FUNDING MODEL

Prepared for the
Wyoming Legislature

Allan Odden
Lawrence O. Picus

PICUS ODDEN & ASSOCIATES

January 15, 2015

TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION AND OVERVIEW

INTRODUCTION

The purpose of this document is to provide the Wyoming Legislature, at the request of the Joint Education Committee's chairman, with a "desk audit" of the current school funding model and make recommendations for areas that may need to be recalibrated to ensure that funding for the state's public K-12 schools remains adequate. The process of recalibrating the funding system must be done at least every five years to meet Wyoming statutory requirement.

Lawrence O. Picus and Associates (today Picus Odden & Associates) began involvement with the Wyoming recalibration cycle in 2005 when it developed a revised funding model based on the firm's Evidence-Based model of school finance adequacy. The Evidence-Based Wyoming Funding Model was enacted during the 2006 session of the Wyoming Legislature and Wyoming began to fund schools based on this new model starting with the 2006-07 school year. We note that while the legislature adopted most of the Evidence-Based (EB) recommendations for each element of the funding model, in a few cases the legislature adopted a more generous formula and in some cases a somewhat less generous formula. Over time, moreover, this has led to consideration of the "cost-based model," which reflects all of our core recommendations, and the "Legislature's funding model," which reflects the decisions made by the legislature. At various points in this report, we will refer to the "cost-based model" or the "Legislature's funding model" to reflect those differences.

For the 2010 recalibration process, Picus Odden & Associates conducted an initial desk audit and participated in the further recalibration of the Funding Model. At the same time, the Legislature contracted for several studies to enhance the way the model was adjusted for inflation, developing a more sophisticated external cost adjustment (ECA) process to enhance the accuracy of cost estimates of the Funding Model's elements. The state also undertook several studies to develop a better understanding of the labor market for school districts and the adequacy of school districts' salaries in Wyoming.

This document represents the next step in the continued review of the Wyoming Funding Model. It is a desk audit of the Model's components as it was enacted and used in school year 2014-15. This document, considers each element of the Wyoming Funding Model, reviews current educational research related to each element and makes a recommendation as to whether or not the Legislature should consider recalibrating that element of the funding model. The decision as to whether or not a recalibration will be conducted, and the extent to which elements of the model will be reviewed remains with the Legislature. This document merely presents our recommendations. There are three reasons why we recommend an element be recalibrated:

1. Cases where the Legislature's funding model differs from the cost-based model. For example, core class sizes in the cost-based model are 15 in grades K-3 and 25 for grades 4 and above, and 16 for grades K-5 and 21 in grades 6 and above in the Legislatively funded model. We recommend recalibration of this element to encourage the Legislature to

reconsider whether it wants to adopt the EB recommendation or continue with its previous legislative decision.

2. Cases where we have changed our EB recommendation. For example, we now recommend each prototypical elementary school be provided a guidance counselor. This differs from our approach in 2010, and is presented as a recommendation for recalibration to ensure the Legislature has the opportunity to consider these changes.

3. Cases where either the context or research evidence has changed significantly over the past several years. A good example is technology and instructional materials, which we recommend be recalibrated because of the emergence of multiple technology based instructional materials and textbooks that were not available in 2010.

WYOMING SCHOOL FUNDING OVER THE PAST DECADE

Table 1.1 displays operating revenues for Wyoming's public schools, on both a total and per pupil basis, for School Years (SY) 2000-01 to SY 2013-14. In the ten years from 2004 to 2014, operating revenues per pupil grew from $10,629 to $17,272, an increase of $6,643 or 62%, substantially greater than inflation.

Table 1.1 also shows a notable increase in general and special fund revenues from SY 2005-06 to SY2006-07. This jump is due largely to the 2005 recalibration, which proposed increased funding that was provided by the 2006 legislature for SY 2006-07. Operating revenues per pupil increased by $2,934 between the 2005-06 and the 2006-07 school year.

The jump in the special revenue fund in SY2010-11 and decline in the following years is primarily a result of one time federal stimulus and Education Jobs revenues provided to all states during the 2008-09 national recession. Because districts received federal funding on a reimbursement basis and the dollars were accounted in the year expended, those revenues impacted to some extent the 2011-12 and 2012-13 school years, but were gone by the 2012-13 school year.

Table 1.1 shows that over the past decade the state has provided large increases in funding for its schools, particularly the funding increase resulting from the 2005 recalibration. The data also show that funding has increased over the past decade by more than 62% in per pupil terms. It would be reasonable to expect a significant improvement in student performance after this notable funding gain. As shown in the next chapter, data from the National Assessment of Education Progress (NAEP) suggest improvements in student performance have not grown at the same pace as the growth in revenues for education in Wyoming.

Table 1.1
Wyoming K-12 Operating Revenues - School Years 2000-01 to 2012-13

School Year	General Fund	Special Revenue Fund	Enterprise Fund	Total Operating Revenue	Wyoming K-12 Enrollment	Operating Revenue per Student
2000-01	$664,657,984	$68,247,112	$21,125,317	$754,030,413	89,531	$8,422
2001-02	$717,117,803	$91,829,659	$22,781,081	$831,728,543	87,897	$9,463
2002-03	$768,273,953	$104,543,158	$22,401,472	$895,218,583	86,117	$10,395
2003-04	$759,619,272	$116,951,879	$24,154,766	$900,725,917	84,741	$10,629
2004-05	$840,452,300	$164,845,081	$25,579,975	$1,030,877,356	83,772	$12,306
2005-06	$898,107,583	$121,829,032	$26,464,070	$1,046,400,685	83,705	$12,501
2006-07	$1,115,203,988	$161,682,089	$29,363,850	$1,306,249,927	84,629	$15,435
2007-08	$1,180,793,264	$158,145,035	$31,249,986	$1,370,188,285	85,578	$16,011
2008-09	$1,193,970,428	$174,995,823	$37,904,243	$1,406,870,494	86,519	$16,261
2009-10	$1,248,998,876	$174,398,890	$38,475,854	$1,461,873,620	87,420	$16,722
2010-11	$1,274,738,890	$212,112,989	$36,257,833	$1,523,109,712	88,165	$17,276
2011-12	$1,331,844,177	$195,130,459	$37,928,804	$1,564,903,440	89,476	$17,490
2012-13	$1,370,360,483	$182,762,773	$37,539,172	$1,590,662,428	90,990	$17,482
2013-14	$1,377,783,140	$177,626,919	$37,376,032	$1,592,786,091	92,218	$17,272

Source: Wyoming Department of Education; WDE 601 WISE Annual District Report and WDE 684 WISE TCS Fall Data

Note: Does not include 85xxx - miscellaneous revenue sources (transfers, bond issuances, sale of assets and contributed capital transfers)

CHAPTER 2
THE SCHOOL IMPROVEMENT MODEL

The intent of the Wyoming School Funding model is to identify the costs of providing the state's basket of educational goods and services and then to provide each school district with adequate funds to provide that basket such that each student is given an equal opportunity to meet Wyoming's student performance standards. Although a direct linkage between funding and student performance does not exist, the Wyoming School Funding Model is designed to allocate adequate resources to provide all students with robust opportunities to meet college and career ready standards. Regardless of whether high school graduates go on to college or enter the workforce, today's global, knowledge-based economy requires a similar set of skills and expertise of each graduate.

No matter what course of studies a high school student completes – college prep or career tech -- all of Wyoming's students are expected to achieve to college and career ready standards. This includes children from low-income homes, students of color, English language learners (ELL) and students with disabilities. The basket of educational goods and services and a cost-based funding model to support that basket must be sufficiently robust to allow students in all 48 school districts in Wyoming to attain these standards. Over the past decade, Wyoming's policy makers have provided sufficient funding to meet this goal and continue to work to ensure the funding model meets the needs of all students.

Before presenting our desk audit of the elements in the Wyoming funding model, this chapter provides a description of the school improvement model that undergirds the Evidence-Based model used to estimate school finance adequacy in Wyoming. Specifically this chapter contains:

- A description of the school improvement model embedded in the Evidence-Based (EB) approach to adequate school funding. The EB model outlines how resources can be used to boost student performance, and

- A summary of actual student achievement gains in Wyoming over the past 23 years – a time frame that includes student performance before the Supreme Court's first ruling in *Campbell* I.

Since 2006 the Legislatively funded model has consistently provided more total funding to Wyoming schools than the estimated level of adequate funding developed through the cost-based model. The Legislature's intent – as we understand it – is to ensure school districts have adequate resources to improve student achievement and meet the State's student performance standards. The data in Table 1.1 show that in its effort to ensure adequate funding for schools, the Legislature has increased operating revenues per pupil by 62% in the past decade. Unfortunately, student achievement has not risen at the same or even similar rate.

THE SCHOOL IMPROVEMENT MODEL EMBEDDED IN THE EVIDENCE-BASED APPROACH TO SCHOOL FINANCE ADEQUACY

The Evidence-Based (EB) model used to estimate a cost-based spending level for schools has been designed to allow districts and schools to provide every child with an equal opportunity to learn to state performance standards. The EB model is unique in that it is derived from research and best practices that identify programs and strategies that boost student learning. Further, the formulas and ratios for school resources that have been developed from that research have been reviewed by dozens of educator panels in multiple states over the past decade. The model relies on two major types of research:

1. Reviews of research on the student achievement effects of each of the model's individual major elements, with a focus more recently on randomized controlled trials, the "gold standard" of evidence on "what works."

2. Studies of schools and districts that have dramatically improved student performance over a 4-6 year period – what is sometimes labeled "a doubling of student performance" on state tests.

As a result of our research and work in other states, the EB approach is now more explicit in identifying the components of a school improvement model, and better articulates how all the elements in the funding model are linked at the school level to strategies that when implemented produce notable improvements in student achievement (see Odden & Picus, 2014 Chapter 5).

Improving and high performing schools have clear and specific student achievement goals, including goals to reduce achievement gaps linked to poverty and minority status. The goals are nearly always specified in terms of performance on state assessments.

Compared to traditional schools where teachers work in isolated classrooms, improving schools organize instruction differently. Regardless of the context – urban, suburban or rural, rich or poor – improving and high performing schools organize teachers into collaborative teams: grade level teams in elementary schools and subject or course teams in secondary schools. With the guidance and support of instructional coaches, the teacher teams work with student data – usually short-cycle or formative assessment data – to:

- Plan standards-based curriculum units
- Teach those units simultaneously
- Debrief on how successful the units were, and
- Make changes when student performance does not meet expectations.

This collaborative teamwork makes instruction "public" over time by identifying a set of instructional strategies that work in the teachers' school. Over time all teachers are expected to use the instructional strategies that have been demonstrated to improve student learning and achievement.

Improving and high performing schools also provide an array of "extra help" programs for students struggling to achieve to standards. This is critical because the number of struggling students is likely to increase as more rigorous programs are implemented to prepare all students for college and careers. Individual tutoring, small group tutoring, after school academic help and summer school focused on reading and mathematics for younger students, and courses needed for high school graduation for older students, represent the array of "extra help" strategies these improving schools deploy. The idea is to "hold standards" constant and vary instructional time.

These schools exhibit dense leadership. Teachers lead by coordinating collaborative teams and through instructional coaching. Principals lead by structuring the school to foster instructional improvement. The district leads by insuring that schools have the resources to deploy the strategies outlined above with a focus on aggressive student performance goals, improving instructional practice and taking responsibility for student achievement results.

Successful and improving schools seek out top talent. They know that the challenge to prepare students for the competitive and knowledge-based global economy is difficult and requires smart and capable teachers and administrators to effectively get the educational job done.

We have continued to enhance the details of the strategy of school improvement embedded in the EB funding model. We most recently summarized our findings in the fifth edition of our textbook (Odden & Picus, 2014) as well as in several books that profile schools and districts that have moved the student achievement needle (Odden & Archibald, 2009; Odden, 2009; Odden, 2012). We have also studied dramatically improving schools in Vermont and Maine as part of school finance studies we recently completed in both states. We found the theory of improvement embodied in the EB model is reflected in nearly all these successful schools (Picus, Odden, et al., 2011; Picus, Odden, et al., 2013). In addition, other researchers and analysts have found similar features of schools that significantly improve student performance and reduce achievement gaps (Blankstein, 2010, 2011; Chenoweth, 2007, 2009).

This year, Greg Duncan and Richard Murnane (2014) reached similar conclusions. They note that for all students to have a chance at success in the emerging global economy, they will need high quality preschool programs, followed by effective elementary and secondary schools. The key features needed in each school include: 1) leadership focused on improving instructional practice; 2) within school organization of teachers into teams that over time create a set of effective instructional practices and deploy them systematically in all classrooms; 3) a culture of assistance (e.g., instructional coaches and ongoing professional development) and accountability (e.g., adults taking responsibility for the impact of their school actions on student performance); and 4) an array of extra help strategies to extend learning time for any student who needs more time to achieve to standards.

Although the details of studies of improving and high performing schools vary, and different authors highlight somewhat different elements of the process, the overall findings are more similar than different. This suggests all schools can improve if they have adequate resources – which Wyoming schools have. The key is to deploy them effectively.

The EB model for adequately funding schools signals how districts and schools can use the funds for programs and strategies that would allow them to produce substantial gains in student academic performance. We organize the elements of the school improvement model embedded in the EB funding model into ten areas. In general, we find that schools and districts that produce large gains in student performance follow ten similar strategies (see Chapter 4 and 5 of Odden & Picus, 2014; Odden, 2009), resources for each of which are included in the EB model:

1. Analyze student data to become deeply knowledgeable about performance issues and to understand the nature of the achievement gap. The test score analysis usually first includes review of state test results and then, over time, analysis of formative/short cycle (e.g., Renaissance Learning Star Enterprise) as well as benchmark assessments (e.g., NWEA MAP) to help tailor instruction to precise student needs, to progress monitor students with an Individual Education Plan to determine whether interventions are working, and to follow the progress of students, classroom and the school over the course of the academic year. Improving schools are "performance data hungry."

2. Set higher goals such as aiming to educate at least 95 percent of the students in the school to proficiency or higher on state reading and math tests; seeing that a significant portion of the school's students reach advanced achievement levels; having more high school students take and pass AP classes; and making significant progress in closing the achievement gap. The goals tend to be explicit as just noted, and far beyond just producing "improvement" or "making AYP." Further, because the goals are ambitious, even when not fully attained they help the school produce large gains in student performance.

3. Review evidence on good instruction and effective curriculum. Successful schools throw out the old curriculum, replace it with a different and more rigorous curriculum, and over time create their specific view of what good instructional practice is to deliver that curriculum. Changing curriculum is a must for schools implementing more rigorous college and career ready standards. And such new curriculum requires changes in instructional practice. Successful schools also want *all* teachers to learn and deploy new instructional strategies in their classrooms and seek to make good instructional practice systemic to the school and not idiosyncratic to each teacher's individual classroom.

4. Invest heavily in teacher training that includes intensive summer institutes and longer teacher work years, provide resources for trainers, and, most importantly, fund instructional coaches in all schools. Time is provided during the regular school day for teacher collaboration focused on improving instruction. Nearly all improving schools have found resources to fund instructional coaches to work with school-based teacher data teams, to model effective instructional practices and to observe teachers and give helpful but direct feedback. This focus has intensified now that schools are delivering a more rigorous curriculum focused on educating all students to college and career proficiency levels. And professional development is viewed as an ongoing and not a "once and done activity."

5. Provide extra help for struggling students and, with a combination of state funds and federal Title 1 funds, provide some combination of tutoring in a 1-1, 1-3, or 1-5 format. In some cases this also includes extended days, summer school, and English language development for all ELL students. These Tier 2 interventions in the Response to Intervention (RTI) approach to helping struggling students achieve to standards are absolutely critical. For many students, one dose of even high quality instruction is not enough; many students need a combination of extra help services in order to achieve to their potential. No school producing large gains in student learning ignored these extra help strategies altogether or argued that small classes or preschool were substitutes.

6. Restructure the school day to provide more effective ways to deliver instruction. This includes multi-age classrooms in elementary schools and block schedules and double periods of mathematics and reading in secondary schools. Schools also "protect" instructional time for core subjects, especially reading and mathematics. Further, most improving schools today organize teachers into collaborative teams – grade level teams in elementary schools and subject/course teams in secondary schools. These teams meet during the regular school day, often daily, and collaboratively develop curriculum units, lesson plans to teach them, and common assessments to measure student learning results. Further, teams debrief on the impact of each collaboratively developed unit, reviewing student learning overall and across individual classrooms.

7. Provide strong leadership and support for data-based decision making and improving the instructional program, usually through the superintendent, the principal and teacher leaders. Instructional leadership is "dense" and "distributed" in successful schools; leadership derives from the teachers coordinating collaborative teacher teams, from instructional coaches, the principal and even district leaders. Both teachers and administrators provided an array of complementary instructional leadership.

8. Create professional school cultures characterized by ongoing discussion of good instruction and teachers taking responsibility for the student performance results of their actions. Over time, the collaborative teams that deliver instruction produce a school culture characterized by: 1) high expectations of performance on the part of both students and teachers, 2) a systemic and school-wide approach to effective instruction, 3) a belief that instruction is public and that good instructional practices are expected to be deployed by every individual teacher, and 4) an expectation that the adults in the school are responsible for the achievement gains (or not made) by students. Professionals in these schools accept responsibility for student achievement results.

9. Bring external professional knowledge into the school, e.g., hiring experts to provide training, adopting new research-based curricula, discussing research on good instruction, and working with regional education service agencies as well as the state department of education. Successful schools do not attain their goals by "pulling themselves up by their own boot straps." They aggressively seek outside knowledge, find similar schools that produce results and benchmark their practices, and operate in ways that typify professionals.

10. Finally, talent matters. Many improving schools today consciously seek to recruit and retain the best talent, from effective principal leaders to knowledgeable, committed and effective teachers. They seek individuals who are mission-driven to boost student learning, willing to work in a collaborative environment where all teachers are expected to acquire and deliver the school's view of effective instructional practice, and who are accountability focused.

In sum, the schools we have studied that have boosted student performance deployed strategies that are strongly aligned with those embedded in the EB model. Further, in our 2008 Wyoming study of school uses of resources, we found that many Wyoming educators shared this view of how schools can increase student performance. These practices bolster our claim that if funds are provided and used to implement these effective strategies, significant student performance gains should follow.

CHANGES IN WYOMING STUDENT ACHIEVEMENT: NAEP SCORES, 1990-2013

Our analysis of student performance on the National Assessment of Student Progress (NAEP) suggests that student performance has improved some, but far less than the rate of increased funding. Table 2.1 displays Wyoming student performance on the NAEP between 1990 and 2013. We use NAEP data because there have been multiple changes in Wyoming's own standardized testing program over those 23 years, leaving NAEP as the only consistent measure of student performance. NAEP data are also comparable across states making analysis of student outcomes on the NAEP tests a better basis for comparison with the rest of the country. The table suggests that Wyoming's students are performing better today than they did in 1990 and in 2003, although the improvement in student achievement has not grown as fast as the growth in per pupil revenues for education.

The largest gains are in mathematics. In Grade 4 math, only 19% of Wyoming's students performed at the proficient or advanced levels in 1992. That percentage more than doubled to 39% by 2003. From 2003 to 2013, the percentage of Wyoming fourth graders performing at the proficient or advanced levels rose to 48%, a 23% increase over the past decade. Grade 8 math performance also improved, but not as much. In 1992, 21% of eighth graders in Wyoming performed at the proficient or advanced levels in math. That percentage rose to 32% in 2003 and then to 38% in 2013, a 19% increase in Grade 8 math student performance over the past decade.

Gains in reading performance were not as large as those in mathematics. In 1992, 33% of Wyoming fourth graders performed at or above the proficient level. That percentage increased to 34% in 2003 and to 37% in 2013. Similarly, the percent of Wyoming Grade 8 students achieving at proficient or advanced levels in reading was 29% in 1998 (the first year for which comparable data are available), and then improved to 34% in 2003 and to 38% in 2013.

There are not sufficient data to document long-term trends in student performance in either science or writing.

Table 2.1
Summary of NAEP Results for Wyoming: 1990-2013

Assessment Subject	Gr	Yr	Average Scale Score: State Avg	(SE)		National Avg	(SE)	Achievement Level: At or Above Basic %	(SE)		At or Above Proficient %	(SE)		At Advanced %	(SE)	
Mathematics	4	2013	247	(0.4)	>	241	(0.2)	90	(0.7)	>	48	(0.9)	>	7	(0.5)	=
Mathematics	4	2011	244	(0.4)	>	240	(0.2)	88	(0.7)	>	44	(1.3)	>	5	(0.4)	=
Mathematics	4	2009	242	(0.6)	>	239	(0.2)	87	(0.9)	>	40	(1.2)	=	4	(0.5)	<
Mathematics	4	2007	244	(0.5)	>	239	(0.2)	88	(0.7)	>	44	(1.0)	>	5	(0.5)	=
Mathematics	4	2005	243	(0.6)	>	237	(0.2)	87	(0.9)	>	43	(1.4)	>	5	(0.7)	=
Mathematics	4	2003	241	(0.6)	>	234	(0.2)	87	(0.8)	>	39	(1.1)	>	4	(0.4)	=
Mathematics	4	2000	229	(1.1)	>	224	(1.0)	71	(2.0)	>	25	(1.4)	=	2	(0.4)	=
Mathematics	4	2000[1]	229	(1.3)	=	226	(1.0)	73	(2.0)	>	25	(1.5)	=	2	(0.5)	=
Mathematics	4	1996[1]	223	(1.4)	=	222	(1.0)	64	(1.7)	=	19	(1.2)	=	1	(0.3)	=
Mathematics	4	1992[1]	225	(0.9)	>	219	(0.8)	69	(1.4)	>	19	(1.1)	=	1	(0.3)	=
Mathematics	8	2013	288	(0.5)	>	284	(0.2)	81	(0.8)	>	38	(1.1)	>	7	(0.5)	<
Mathematics	8	2011	288	(0.6)	>	283	(0.2)	80	(1.0)	>	37	(1.2)	>	7	(0.7)	=
Mathematics	8	2009	286	(0.6)	>	282	(0.3)	78	(1.2)	>	35	(1.1)	=	7	(0.6)	=
Mathematics	8	2007	287	(0.7)	>	280	(0.3)	80	(1.1)	>	36	(1.6)	>	7	(0.7)	=
Mathematics	8	2005	282	(0.7)	>	278	(0.2)	76	(1.1)	>	29	(1.4)	=	3	(0.4)	<
Mathematics	8	2003	284	(0.7)	>	276	(0.3)	77	(1.0)	>	32	(1.0)	>	4	(0.5)	=
Mathematics	8	2000	276	(1.0)	>	272	(0.9)	69	(1.3)	>	23	(1.0)	=	3	(0.4)	=
Mathematics	8	2000[1]	277	(1.2)	=	274	(0.8)	70	(1.4)	>	25	(1.1)	=	4	(0.5)	=
Mathematics	8	1996[1]	275	(0.9)	>	271	(1.2)	68	(1.2)	>	22	(1.0)	=	2	(0.6)	=
Mathematics	8	1992[1]	275	(0.9)	>	267	(1.0)	67	(1.3)	>	21	(1.1)	=	2	(0.4)	=
Mathematics	8	1990[1]	272	(0.7)	>	262	(1.4)	64	(1.3)	>	19	(0.9)	>	2	(0.2)	=
Reading	4	2013	226	(0.6)	>	221	(0.3)	75	(1.0)	>	37	(0.9)	>	7	(0.5)	=
Reading	4	2011	224	(0.8)	>	220	(0.3)	71	(1.3)	>	34	(1.1)	=	7	(0.6)	=
Reading	4	2009	223	(0.7)	>	220	(0.3)	72	(1.1)	>	33	(1.0)	=	5	(0.6)	<
Reading	4	2007	225	(0.5)	>	220	(0.3)	73	(1.0)	>	36	(1.0)	>	8	(0.9)	=
Reading	4	2005	223	(0.7)	>	217	(0.2)	71	(1.2)	>	34	(1.4)	>	7	(0.6)	=
Reading	4	2003	222	(0.8)	>	216	(0.3)	69	(1.3)	>	34	(1.1)	>	7	(0.7)	=
Reading	4	2002	221	(1.0)	>	217	(0.5)	68	(1.4)	>	31	(1.3)	=	6	(0.5)	=
Reading	4	1998	218	(1.5)	>	213	(1.2)	64	(2.0)	>	29	(1.5)	=	6	(0.7)	=
Reading	4	1998[1]	219	(1.6)	=	215	(0.8)	65	(2.1)	=	30	(2.0)	=	6	(0.7)	=
Reading	4	1994[1]	221	(1.2)	>	212	(1.1)	68	(1.7)	>	32	(1.4)	=	6	(0.6)	=
Reading	4	1992[1]	223	(1.1)	>	215	(1.0)	71	(1.6)	>	33	(1.5)	>	5	(0.6)	=

Assessment Subject	Gr	Yr	Average Scale Score State Avg	(SE)		National Avg	(SE)	Achievement Level: At or Above Basic %	(SE)		At or Above Proficient %	(SE)		At Advanced %	(SE)	
Reading	8	2013	271	(0.6)	>	266	(0.2)	84	(0.7)	>	38	(1.0)	>	2	(0.4)	<
Reading	8	2011	270	(1.0)	>	264	(0.2)	82	(1.0)	>	38	(1.6)	>	3	(0.5)	=
Reading	8	2009	268	(1.0)	>	262	(0.3)	82	(1.4)	>	34	(1.8)	=	2	(0.5)	=
Reading	8	2007	266	(0.7)	>	261	(0.2)	80	(1.1)	>	33	(1.0)	>	2	(0.5)	=
Reading	8	2005	268	(0.7)	>	260	(0.2)	81	(1.0)	>	36	(1.4)	>	2	(0.4)	=
Reading	8	2003	267	(0.5)	>	261	(0.2)	79	(0.9)	>	34	(1.1)	>	2	(0.2)	=
Reading	8	2002	265	(0.7)	>	263	(0.5)	78	(1.3)	>	31	(1.1)	=	2	(0.3)	=
Reading	8	1998	263	(1.3)	=	261	(0.8)	76	(1.8)	>	31	(1.5)	=	2	(0.5)	=
Reading	8	1998[1]	262	(1.3)	=	261	(0.8)	76	(1.4)	>	29	(1.5)	=	2	(0.4)	=
Science	4	2009	156	(0.7)	>	149	(0.3)	80	(1.0)	>	37	(1.2)	>	#	(†)	=
Science	8	2011	160	(0.5)	>	151	(0.2)	78	(0.9)	>	38	(1.1)	>	1	(0.4)	=
Science	8	2009	158	(0.7)	>	149	(0.3)	74	(1.2)	>	36	(1.3)	>	1	(0.3)	=
Writing	4	2002	150	(1.1)	=	153	(0.5)	85	(0.9)	=	23	(1.4)	<	1	(0.2)	<
Writing	8	2007	158	(1.0)	>	154	(0.3)	91	(0.9)	>	34	(1.5)	>	1	(0.3)	=
Writing	8	2002	151	(0.9)	=	152	(0.6)	86	(1.0)	=	28	(1.2)	=	1	(0.3)	<
Writing	8	1998	146	(1.4)	=	148	(0.6)	81	(1.5)	=	23	(1.7)	=	1	(0.4)	=

[1]Accommodations were not permitted for this assessment.
Rounds to zero.
† Not applicable.
Note: Standard Errors (SE) are shown in parentheses.

\> Higher than National public
= Not significantly different from National public
< Lower than National public

Source: National Center for Education Statistics (NCES), National Assessment of Educational Progress (NAEP), generated using the State Profiles. http://nces.ed.gov/nationsreportcard/states/

The NAEP achievement data show that student performance in Wyoming has improved during the time frame in which school finance adequacy has been a major policy issue in the state. In nearly all cases Wyoming student achievement equals or exceeds the national average. On the other hand, funding has grown at a substantially higher rate than has student performance, and in no case do at least 50% of Wyoming students achieve at proficient or advanced levels, performance levels that are critical for student opportunity in the knowledge-based global economy.

Wyoming's taxpayers, parents, legislators, educators and students will need to determine the degree to which student performance needs to improve. We would argue that the funds the state has provided to its schools through the EB-based Wyoming School Funding Model provides resources that could be used to boost student achievement to higher levels than have been obtained to date.

CHAPTER 3
USING THE EVIDENCE-BASED MODEL TO CONDUCT A DESK AUDIT OF THE WYOMING FUNDING MODEL

This chapter uses the Evidence-Based (EB) model to conduct a desk audit of the Wyoming Funding Model. The four parts of this chapter include the following:

1. Staffing for core programs, which include full-day kindergarten, core teachers, elective/specialist teachers, instructional facilitators/coaches, core tutors, core guidance counselors, core nurses (the latter three constituting changes and additions to the EB model), substitute teachers, supervisory aides, librarians, principals/assistant principals and school secretaries.

2. Dollar per student resources, gifted and talented, professional development, computers and other technology, instructional materials and supplies, and extra duty/student activities.

3. Central functions, which include maintenance and operations, central office, and transportation.

4. Resources for struggling students including tutors, pupil support, extended day, summer school, ELL programs, alternative schools and special education.

In each section, we provide an analysis of the current Wyoming model parameters, followed by an analysis of those parameters in the context of current research and the current implementation of the EB model. This is followed by an analysis of resource use by Wyoming school districts.

Table 3.1 below provides a summary of all the desk audit recommendations suggested by the EB model.

Table 3.1
Summary of Desk Audit Recommendations

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
STAFFING FOR CORE PROGRAMS				
1. Full Day Kindergarten	Full day kindergarten program. Each K student counts as 1.0 pupil in the funding system.	Requires districts to provide a full day kindergarten program for children who turn age 5 before September 15. (At least one school in each district must have a full-day kindergarten program). Fully funded for attending students.	$0	No change from 2010 recommendation. No need for a formal recalibration.
2. Elementary Core Teachers/Class Size	Grades K-3: 15 Grades 4-5 (and 6 if included in an elementary school): 25	K-5: 16, Class size of 16 also applies to grade 6 when included in an elementary school	$23,048,806	No change from 2010 recommendation. Recalibrate
3. Secondary Core Teachers/Class Size	Grades 6-12: 25	Grades 6-12: 21	$28,980,771	No change from 2010 recommendation. Recalibrate
4. Elective/Specialist Teachers	20% of core elementary teachers	20% of core elementary teachers	$0	No change from 2010 recommendation. No need for a formal recalibration.

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
	20% of core middle school teachers	33 1/3 % of core middle school teachers.	$8,151,402	No change from 2010 recommendation. Recalibrate
	33 1/3 % of core high school teachers	33 1/3 % of core high school teachers.	$0	No change from 2010 recommendation. No need for a formal recalibration.
5. Additional Vocational/Career Technical Teachers	No additional vocational education teachers resourced.	Apply an additional weighting factor of 29 percent to vocational education student FTEs. Based upon weighted student count, provide an additional teacher for every 21 students.	$2,057,916	No change from 2010 recommendation. Recalibrate
6. Minimum Teachers	A minimum of 3.65 teachers provided for elementary schools, a minimum of 7 teachers for middle schools and high schools with ADM greater than 49. Resourced at the highest grade band level. For schools 49 & below, minimum teacher resources are provided on a prorated basis at 1	A minimum of 6 teachers provided for elementary school grade bands with ADM greater than 49. A minimum of 8 teachers provided for middle school grade bands with ADM greater than 49. A minimum of 10 teachers provided for high school grade bands with ADM	$14,337,242	No change from 2010 recommendation. Recalibrate

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
	teacher for every 7 students.	greater than 49. For school grade bands of 49 & below, minimum teacher resources are provided on a prorated basis at 1 teacher for every 7 students.		
7. Instructional Facilitators/Coaches	1.5 instructional facilitator/coaches for prototypical elementary (288 ADM) and secondary (315 ADM) schools.	Funded outside block grant in a categorical grant equal to 60 percent of consultant recommendation.	-$13,760,799	No change from 2010 recommendation. Recalibrate
8. Core Tutors/Tier 2 Intervention	Tutor positions provided on basis of at-risk student count, with a minimum of 1.0 for each school prototype.	Tutor positions provided on basis of at-risk student count, with a minimum of 1.0 for each school prototype.	$0	One tutor position in each prototypical school* Recalibrate This is a new EB (cost-based) recommendation. *Additional tutors are enabled through the at-risk pupil count in Element 26.
9. Substitute Teachers	5 % of core and elective teachers, instructional coaches, tutors (and	5 % of core and elective teachers, instructional coaches,	$0	No change from 2010 recommendation.

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
	teacher positions in extended day, summer school and ELL).	tutors (and teacher positions in extended day, summer school and ELL).		No need for a formal recalibration.
10. Core Guidance Counselors and Nurses	1 guidance counselor position for every 250 middle and high school students.	1 guidance counselor position for every 250 middle and high school students	$0	1 guidance counselor for every 288 grade K-5 students 1 guidance counselor for every 250 grade 6-12 students* 1 nurse for every 750 K-12 students Recalibrate This is a new EB recommendation.
11. Supervisory and Instructional Aides	Provide funding at an amount equal to 2.0 FTE positions for 288 ADM prototypical elementary school; 2.0 FTE for 315 ADM prototypical middle school; 5.0 FTE for 630 ADM prototypical high school; resourced at the highest-grade prototype using total school ADM.	Provide funding at an amount equal to 2.0 FTE positions for 288 ADM prototypical elementary school; 2.0 FTE for 315 ADM prototypical middle school; 5.0 FTE for 630 ADM prototypical high school; resourced at the highest-grade prototype using total school ADM.	$0	2 for prototypical elementary school 2.0 for prototypical middle school of 315 3 for prototypical high school of 630 Resourced at the highest-grade prototype using total school ADM. Recalibrate

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
12. Librarians and Librarian Media Technicians	Fund at the district level rather than school level. For districts with 0-300 ADM, provide funding for 1 librarian and 1 library clerk. For districts with 301-630 ADM, prorate from the 300 ADM level up to 2 librarians, but retain the 1 librarian clerk for the 630 ADM. Above 630 ADM, 1 librarian for every 288 elementary ADM and 1 librarian and 2 library clerks for every 630 secondary ADM, with a minimum of 2 librarians and 1 library clerk. No library media technicians funded, but rather a separate computer technician position in central office.	For non-alternative schools and small schools, provide 1 librarian for the prototypical elementary schools (288 ADM) prorate up and down, below and above 288 ADM. For middle or high schools with ADM between 105 and 630 ADM, 1 librarian. Below 105 prorate down and above 630 prorate. For non-alternative schools and small schools, provide 1 library media technician for every 315 middle and high school ADM, prorated up and down.	$3,474,482 $3,034,238 Total Cost Difference $6,508,720	Fund at the district level, 1 librarian for every 315 K-8 students and 1 librarian for every 630 9-12 students No library media technicians funded under this area – see computer technician section – Element 23 Recalibrate This is a new EB recommendation.
13. Principals and Assistant Principals	1.0 principal for all schools down to 96 ADM for elementary schools and 105 ADM	1.0 principal for all schools down to 96 ADM for elementary schools and 105 ADM		No change from 2010 recommendation. No need for a formal

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
	for middle and high schools, prorated by ADM below these ADM levels. 1.0 assistant principal for every 288 elementary ADM beginning at 289 ADM; 1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM.	for middle and high schools, prorated by ADM below these ADM levels. 1.0 assistant principal for every 288 elementary ADM beginning at 289 ADM;1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM.	$0	recalibration.
14. School Site Secretarial Staff	Provide 1.0 secretary for all schools down to 96 ADM for elementary and 105 ADM for middle and high schools, prorated by ADM below these ADM levels. Provide 1.0 secretary for 105 to 315 middle school ADM, prorated down below 105 ADM and prorated up for 316 ADM and above.	Provide 1.0 secretary for all schools down to 96 ADM for elementary and 105 ADM for middle and high schools, prorated by ADM below these ADM levels. Provide 1.0 secretary for 105 to 315 middle school ADM, prorated down below 105 ADM and prorated up for 316 ADM and above.	$0	Simplify the formula to provide just secretary staff. Provide 2.0 secretary positions for all elementary and middle schools down to 96 ADM for elementary and 105 ADM for middle schools. This is prorated by ADM below these levels, and prorated up at rate of 1 for every 144 elementary 1 for every

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
	Provide 1.0 FTE secretary for 105 to 630 high school ADM, prorated down below 105 ADM and prorated up for 631 ADM and above. Resourced at the highest-grade prototype using total school ADM. Provide1.0 clerical for 288 ADM prototypical elementary school. Provide 1.0 clerical for ADM prototypical middle school. Provide 2.0 clerical for 315 ADM prototypical high school (total of 4.0 secretaries for 630 students). All FTE positions prorated up or down from prototypical level and resourced at the	Provide 1.0 FTE secretary for 105 to 630 high school ADM, prorated down below 105 ADM and prorated up for 631 ADM and above. Resourced at the highest-grade prototype using total school ADM. Provide1.0 clerical for 288 ADM prototypical elementary school. Provide 1.0 clerical for ADM prototypical middle school. Provide 2.0 clerical for 315 ADM prototypical high school (total of 4.0 secretaries for 630 students). All FTE positions prorated up or down from prototypical level		and 157.5 middle school students. Provide 3.0 secretary positions for all high schools reduced to two for 315 ADM, prorated by ADM below 315 ADM, and prorated up above 630 at rate of 1 for every 200 high school ADM. All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM. Recalibrate This is a new EB recommendation.

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
	highest-grade prototype using total school ADM.	and resourced at the highest-grade prototype using total school ADM.		
DOLLARS PER STUDENT RESOURCES				
15. Gifted and Talented Students	$25 per ADM in 2010 inflated annually	Provide an amount equal to$29.41 per ADM	Modest difference	Precise the dollar figure during 2015 recalibration.
16. Intensive Professional Development	10 days of student free time for training $100 per ADM for trainers inflated annually, to $124.46	10 days of student free time for training $100 per ADM for trainers inflated to $117.64.	Very minor difference part of LSO estimate that combines a number of areas	Precise the dollar figure during 2015 recalibration.
17. Instructional Materials	Instructional materials: $149.23 per ADM for elementary and middle schools and $186.54 per ADM for high schools.	$335.93 per ADM for elementary and middle schools and $411.33 per ADM for high schools.	$18,104,526	Recalibrate
18. Short Cycle/Formative Assessments	$37.70 per ADM and not subject to an ECA.	$37.70 per ADM and not subject to an ECA.	$0	Precise the dollar figure during 2015 recalibration.
19. Technology and Equipment	$250 per pupil inflated annually to $266.49.	Provide an amount equal to $294 per ADM.	$3,281,514	Recalibrate
20. Career and Technical Education Equipment/Materials	$9,622.70 per vocational education teacher FTE. $1,854.45 for equipment allowance; $6,841.74 for supply allowance,	Inflated amounts of $9,094.97 per vocational education teacher FTE. $1,752.75 for equipment allowance;	Marginal difference in equipment costs Wyoming also provides an extra weight of 0.29 for	Precise the dollar figure during 2015 recalibration.

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
	and $926.51 for equipment replacement.	$6,466.52 for supply allowance, and $875.70 for equipment replacement.	all students in career technical programs to lower those class sizes (see Element 5 above).	
21. Extra Duty Funds/Student Activities	$308.04 per ADM.	Funded at grade-band level, by school. For grades K-5, provide an amount equal to $24.23 per student. For grades 6-12, use inverse sliding scales based on student enrollment for middle (grades 6-8) and high (grades 9-12) school grades levels. Middle school funding levels range from $796.95 for 1 ADM and $205.90 per ADM for a school of 1,260 ADM. High school funding levels range from $2,054.39 for 1 ADM and $605.59 per ADM for a school of 1,260 ADM. Alternative schools	$5,535,663	Recalibrate

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
		receive an amount equal to $291.15 per ADM.		
CENTRAL OFFICE FUNCTIONS				
22. Operations and Maintenance	Separate computations for custodians, maintenance workers and groundskeepers as outlined in the analysis and evidence section below.	Separate computations for custodians, maintenance workers and groundskeepers as outlined in the analysis and evidence section below.	$0	Recalibrate
23. Central Office Staffing/Non-Personnel Resources	Less than 500 ADM – 3 administrative and 3 classified position Between 501 and 1,000 ADM – 4 administrative and 4 classified positions Beyond 1,000 ADM, provide 1 additional administrator position for every 833 ADM and provide 1 additional classified position for every 500 ADM.	Less than 500 ADM – 3 administrative and 3 classified position Between 501 and 1,000 ADM – 4 administrative and 4 classified positions Beyond 1,000 ADM, provide 1 additional administrator position for every 625 ADM and provide 1 additional classified position for every 417 ADM.	$3,834,851	A per pupil amount calculated from a 3,900-student prototypical school district. This is prorated to districts with 1,000 students. From 1000 to 400 students funding should remain at the level of funding for the central office of a 1,000 student district. This would generate approximately 2 administrative and 2.5 secretarial positions. From 400 to 200 students, the positions should be prorated down to1 professional

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
				and 1 secretarial position, and remain at that level for smaller districts. Recalibrate
	Provide an amount equal to$373.38 per ADM for non-personnel resources.	Provide an amount equal to$352.91 per ADM for non-personnel resources.	Small difference combined with other estimates in LSO analysis.	Precise dollar figures during 2015 recalibration.
24. Transportation	Recommend no changes to current policy of 100% of approved (to and from school and approved activities) transportation costs.			
25. Food Services	Both the EB model and the Wyoming Legislature assume this is a self-supporting function and thus no additional resources are provided.			
26. Tutors	1 tutor position for every 100 at-risk students, with a minimum of one tutor position in each prototypical school.	1 tutor position for every 100 at-risk students, with a minimum of one tutor position in each prototypical school.	$0	One tutor position for every 125 at risk students (in addition to the one tutor position in each prototypical school). These positions are provided additional days for professional development (Element 16) and substitute days (Element 9) discussed above. Recalibrate

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
				This is a revised EB recommendation.
27. Pupil Support	1 pupil support position for every 100 at-risk students, with a minimum of 1 position for each prototypical elementary, middle and high school, resourced at the highest-grade prototype using the total school ADM.	1 pupil support position for every 100 at-risk students, with a minimum of 1 position for each prototypical elementary, middle and high school, resourced at the highest-grade prototype using the total school ADM.	$0	One pupil support position for every 125 at-risk students These positions are provided additional days for professional development (Element 16) discussed above. Recalibrate This is a revised EB recommendation
28. Extended Day Programs	1.0 teacher position for every 30 at-risk students or 3.33 FTE per 100 such students. Position paid at the rate of 25 percent of annual salary—enough to pay a teacher for a 2-hour extended-day program, 5 days per week. This formula equates to 1 teacher position for every 120 at-risk students.	For both extended day and summer, funding provided outside of block grant and in form of a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students for both summer school and extended day programs. A minimum 0.50 FTE is provided for school districts that do not generate that amount	-$8,979,455 including both extended day and summer school.	No change from 2010 recommendation. Recalibrate

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
		based upon the district's at-risk count.		
29. Summer School	1.0 teacher position for every 30 at-risk students or 3.33 FTE per 100 such students. Position paid at the rate of 25 percent of annual salary—enough to pay a teacher for a six to eight week 4 hour per day summer school program and include adequate time for planning and grading This formula equates to 1 teacher position for every 120 at-risk students.	For both extended day and summer, funding provided outside of block grant and in form of a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students for both summer school and extended day programs. A minimum 0.50 FTE provided for school districts that do not generate that amount based upon the district's at-risk count.	-$8,979,455 included both extended day and summer school.	No change from 2010 recommendation. Recalibrate
30. English Language Learner (ELL) Students	1.0 teacher position for every 100 identified ELL students.	1.0 teacher position for every 100 identified ELL students.	$0	No change from 2010 recommendation. No need for a formal recalibration.
31. Alternative Schools	No separate formula; assumes all alternative schools have 49 or fewer students and thus qualify for the small	Provide funding for all staff at a ratio of 1 assistant principal and 1 teacher position for every 7 students.	-$88,082	No change from 2010 recommendation. Recalibrate

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
	school formula of 1 AP plus 1 teacher position for every 7 students.			
32. Special Education		100% cost reimbursement		1 teacher for every 150 students in the school 1 aide for every 150 students in the school Federal funds Full state funding for students with severe disabilities To explore this option as part of the 2015 recalibration, WY would need to create a great deal of new data; specifically it would need to separate severe and profound special education expenditures from all others.
33. Salary Levels 34. Health Insurance 35. Benefits	All Three areas require further study as part of Recalibration. See report for details.			
36. Regional Cost Adjustments	Adjust model salaries for regional differences by using the 2011 hedonic wage index as	Adjust model salaries for regional differences by using the greater of the	$6,560,511	Recalibrate.

Model Element	2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
	calculated by state consultants (Taylor).	Wyoming Cost of Living Index (average of the past 6 semiannual calculations) or the 2005 hedonic wage index as calculated by state consultants (Baker via LOP & Associates), with a minimum index value of 1.00.		
37. External Cost Adjustments	Continue to use four existing indices and apply them annually to the cost-based model as well as continue a monitoring approach for applying ECAs to the Legislature’s funded model.			
38. School District School Finance Audit Process	Continue audit process and establish clear rules for accuracy of district data reporting.			

HOW THE INFORMATION BELOW IS ORGANIZED

In the material that follows we provide the following comparison data for each component of the Wyoming Funding Model:

- The cost model, which is the EB recommendations from the 2010 recalibration
- The Legislature's funding model, which represents current Wyoming policy and describes the current operation of the Wyoming Funding Model
- An estimate of the cost differences between the cost model and the Legislature's funding model, and
- Our current EB model recommendations including our recommendation as to whether or not we recommend recalibration of that funding model element.

This information is provided in table form to facilitate review of each element. Following each table, we provide analysis and evidence supporting the EB models recommendations. Finally we provide an assessment of how districts in Wyoming have used the resources provided by the Wyoming funding Model for that particular component.

Three Tier Approach

Before proceeding, we note that the design of the EB model, reflects the *Response to Intervention (RTI)* model. RTI is a three-tier approach to meeting student needs. Tier 1 refers to core instruction for all students. The EB model seeks to make core instruction as effective as possible both with its modest class sizes, provisions for collaborative time, and robust professional development resources. Effective core instruction is the foundation on which all other educational strategies depend. Tier 2 services are provided to students struggling to achieve to standards before being given an IEP and labeled as a student with a disability. The EB model's current Tier 2 resources include one core tutor for every prototypical school and additional resources triggered by at-risk student counts that provide funding for tutoring, extended day, summer school and additional pupil support. Tier 3 includes all special education services.

Student Counts

In addition, student counts used for the formula – ADM – and at-risk students need to be defined. Average Daily Members (ADM) is defined as the greater of the prior year or the three-year average for each school. At-risk students are defined as the unduplicated count of English language learners, free and reduced lunch eligible students in grades K-12, and mobile students in grades 6-12.

Prototypical Schools

A key component of the EB model is the use of prototypical schools to generate initial resource allocation strategies followed by prorating resources to actual schools and/or districts. In the

Wyoming Funding Model, prototypical school sizes are used as the basis for estimating resource needs and for pro-rating resource generation and thus costs based on the actual enrollment in a school.

In other states we have recommended prototypical schools sizes of 432 or 450 for elementary schools, 450 for middle schools and 600 for high schools. This generally derives from EB model class size recommendations, which differ from the class sizes used in the Legislature's funding model (see model components 3 and 4 below), and from larger average school sizes generally found in other states.

In Wyoming the current school size prototypes used in the model are:

- Elementary Schools: 288 students
- Middle Schools: 315 students
- High Schools: 630 students

These prototypes were developed in 2005 following a Legislative decision to establish core class sizes of 16 at the elementary level and 21 at the secondary level. With average class sizes of 16, the 288-student prototypical elementary school has 48 students at each grade level (K-5) resulting in what is typically called a three-section school – three classrooms of 16 students at each grade level. The prototypical middle school (315 students) has 105 students at each grade level (5 classes of 21 at each grade level). A prototypical high school has 630 students or is twice the size of the prototypical middle school

Because Wyoming has many small schools, these prototypical school sizes make it straightforward to recognize smaller prototype schools. These are generally proportional to the prototypes. For example, at the elementary level, 288 students represent a three-section school, a 192-student elementary school would be a two-section school (2/3 the number of students as in the prototypical elementary school) and a 96-student elementary school would be a one-section school with 1/3 the number of students of the prototypical elementary school.

STAFFING FOR CORE PROGRAMS

This section covers full-day kindergarten, core teachers, elective/specialist teachers, instructional facilitators/coaches, core tutors, core guidance counselors, core nurses (the latter three constituting changes and additions to the EB model), substitute teachers, supervisory aides, librarians, principals/assistant principals and school secretaries.

1. Full Day Kindergarten

The table below shows that both the EB model and the current Wyoming School Funding Model call for full day kindergarten. Details on the resources kindergarten students generate are included in the sections that follow below.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
Full day kindergarten program. Each K student counts as 1.0 pupil in the funding system.	Requires districts to provide a full day kindergarten program for children who turn age 5 before September 15. (At least one school in each district must have a full-day kindergarten program). Fully funded for attending students. Same as consultant recommendation.	$0	No change from 2010 recommendation. No need for a formal recalibration.

*The source for all cost differences reported in this chapter is *"K-12 Education Resource Block Grant Funding Model: Model Component Variances between Wyoming Legislature (Law) and Consultant (Cost-Based) Recommendations School Year 2014-2015," prepared by the LSO.*

Analysis and Evidence

Research shows that full-day kindergarten, particularly for students from low-income backgrounds, has significant, positive effects on student learning in the early elementary grades (Gullo, 2000; Slavin, Karweit & Wasik, 1994). Fusaro's (1997) late 1990s meta-analysis of 23 studies comparing the achievement effect of full-day kindergarten to half-day kindergarten programs, found an average effect size of +0.77, which is substantial.[1] Children participating in full-day kindergarten programs do better in learning the basic skills of reading, writing, and mathematics in the primary grades than children who receive only a half-day program or no kindergarten at all (see also Lee, Burkam, Ready, Honigman & Meisels, 2006).

In 2003, using nationally-representative, longitudinal data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS–K), Denton, West & Walston (2003) showed that children who attended full-day kindergarten had a greater ability to demonstrate reading knowledge and skill than their peers in half-day programs, across the range of family backgrounds. Cooper, et al.'s (2010) comprehensive meta-analysis reached similar conclusions finding the average effect size of students in full day versus half-day kindergarten to be +0.25. Moreover, a *randomized controlled trial*, the "gold standard" of education research, found the effect of full-day versus half-day kindergarten to be about +0.75 standard deviations (Elicker & Mathur, 1997). As a result of this research, funding full day kindergarten for 5 year-olds as well

[1] Effect size is the amount of a standard deviation in higher performance that the program produces for students who participate in the program versus students who do not. An effect size of 1.0 indicates that the average student's performance would move from the 50th to the 83rd percentile. The research field generally recognizes effect sizes greater than 0.25 as significant and greater than 0.50 as substantial.

as for 4 year-olds is an increasingly common practice among the states (Kauerz, 2005). Since research suggests that children from all backgrounds can benefit from full-day kindergarten programs, the EB model supports a full day program for all students, by counting such students as 1.0 in the state aid formula.

2. Elementary Core Teachers/Class Size

Core teachers are defined as the grade-level classroom teachers in elementary schools. In middle and high schools core teachers are those who teach core subjects such as mathematics, science, language arts, social studies and world language. Advanced Placement classes in these subjects are considered core classes.

In the analysis that follows, we provide analyses of the number of teachers employed by school districts in Wyoming with the number of teachers generated through the Wyoming Funding Model. There are several factors to consider in the analysis that follows.

- The data we present come from the *Continuing Review of Educational Resources in Wyoming* (CRERW) report prepared annually by the WDE.
- The data on numbers of teachers compared to the Wyoming Funding Model does not distinguish between core and specialist teachers; consequently some comparisons below are presented in the discussion of core teachers and others following the discussion of specialist or elective teachers.
- Many of Wyoming's schools contain grade spans that are not easily categorized at elementary, middle or high school (e.g. k-12 schools, alternative schools, etc.). The WDE reports data for these schools as well as more traditionally organized schools. Tables presented here rely on traditionally organized schools, but tables that include the same data for all schools (as well as summarize district-by-district findings when appropriate) are provided following the discussion of specialist/elective teachers.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
Grades K-3: 15 Grades 4-5 (and 6 if included in an elementary school): 25	K-5: 16, Class size of 16 also applies to grade 6 when included in an elementary school	$23,048,806	No change from 2010 recommendation. Recalibrate

Because specialist teachers are generated as a percentage of the number of core teachers, the cost difference presented in this table includes the difference between consultant recommendations and current practice for both core AND specialist teachers.

Analysis and Evidence

The gold standard of educational research is randomized controlled trials, which provide scientific evidence on the impact of a certain treatment (Mosteller, 1995). Thus, the primary evidence on the impact of small classes today is the Tennessee STAR study, which was a large scale, *randomized controlled experiment* of class sizes of approximately 15 compared to a control group of classes with approximately 24 students in kindergarten through grade 3 (Finn and Achilles, 1999; Word, et al., 1990). The study found that students in the small classes achieved at a significantly higher level (effect size of about 0.25 standard deviations) than those in regular class sizes, and that the impacts were even larger (effect size of about 0.50) for low income and minority students (Finn, 2002; Grissmer, 1999; Krueger, 2002). The same research also showed that a regular class of 24-25 with a teacher and an instructional aide *did not* produce a discernible positive impact on student achievement, a finding that undercuts proposals and wide spread practices that place instructional aides in elementary classrooms (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001).

Subsequent research showed the positive impacts of the small classes in the Tennessee study persisted into middle and high school years, and the years beyond high school (Finn, Gerger, Achilles & J.B. Zaharias, 2001; Konstantopulos & Chung, 2009; Krueger, 2002; Mishel & Rothstein, 2002; Nye, Hedges & Konstantopulos, 2001a, 2001b). Longitudinal research on class size reduction also found that the lasting benefits of small classes include a reduction in the achievement gap in reading and mathematics in later grades (Krueger & Whitmore, 2001).

Although some argue that the impact of the small class sizes is derived primarily from kindergarten and grade 1, Konstantopoulos and Chung (2009) found that the longer students were in small classes (i.e., in grades K, 1, 2 and 3) the greater the impact on grade 4-8 achievement. They concluded that the full treatment – small classes in all of the first four grades – had the greatest short and long term impacts.

Though differences in analytic methods and conclusions characterize some of the debate over class size (see Hanushek, 2002 and Krueger, 2002), we side with those concluding that class size makes a difference, but only class sizes of approximately 15 students with one teacher (and not class sizes of 30 with an aide or two teachers) and only for kindergarten through grade 3.

Finally in these times when funds for schools are scarce, it is legitimate to raise the issue of the cost of small classes versus the benefits. Whitehurst and Chingos (2011) argue that though the Tennessee STAR study supports the efficacy of small classes, there is other research today that produced more ambiguous conclusions. However, they also note that the other research includes class size reductions in grades above K-3 and “natural experiments” rather than randomized controlled trials. Most importantly, they also conclude that while the costs of small classes are high, the benefits, particularly the long-term benefits, outweigh the costs and conclude that small class sizes in grades K-3 “pay their way.”

We consistently recommend that states fund all other elements of the EB model before putting funds into the class size recommendations displayed above. We have made this recommendation because research shows many other components of the EB model are more cost effective in terms of improving student performance – particularly for improving the performance of struggling students.

Resource Use Analysis

The cost-based model for grades K-5, when applied to a three section, 288 student prototypical Wyoming school would generate 16.64 teachers with an average pupil core-teacher ratio of 17.3 students per teacher, compared to 18 teachers at a pupil core-teacher ratio of 16 in Legislature's funding model. [2] Thus the number of core teachers in a prototypical elementary school in Wyoming exceeds the EB model recommendation. The pupil teacher ratio of 16 was used in the Wyoming funding model because it was the same as had been used by earlier studies conducted by MAP.

There is however, a significant difference in the MAP models and the EB based (current) Wyoming funding model. It is our understanding that the MAP pupil teacher ratio of 16 did not distinguish between core teachers and elective teachers – as does both the Legislature's funding model and the cost-based model. Thus, under MAP, it was assumed that a pupil teacher ratio of 16 provided both core AND elective teachers, providing a total number of 18 teachers for the 288 prototypical elementary school.

Under the cost-based model, core teachers are generated at the rate of one for every 15 students in grade K-3, and one for every 25 students in grades 4 and 5. So at 48 students per grade, the number of students in grades K-3 is 192 (48 times 4). This produces 12.8 teacher positions (192/15). The number of students in grades 4-5 is 96 (48 times 2); this produces 3.84 teacher positions (96/25). Thus the Cost-based model provides for 16.64 teacher positions versus the MAP model of 18. But the Cost-based model also provides for elective teachers for elementary schools generated at a rate of 20 percent of the number of core teachers. Thus, the Cost-based model provides for an additional 3.3 teachers, or a total of 20 elementary teacher positions, a number than is greater than the MAP model of 18. Further, under the Legislature's funding model, a prototypical elementary school is provided an even larger number of teachers – 21.6 – (18 core teachers and 20 percent or 3.6 more specialist teachers) compared to the 18 the old MAP model generated. In short, both the Cost-based model and the Legislature's funding model provide more elementary core and elective teacher positions than the previous MAP model.

If it is assumed that the old MAP figure of 16 was a "teacher staffing ratio" including core and elective teachers, and not a class size recommendation, and further assumed that each teacher provides instruction for five of six instructional hours of the regular school day, then the MAP pupil teacher ratio of 16 would actually lead to a core class size of about 19 (allowing for elective teachers to provide the sixth hour of instruction), a number that is higher than the cost-based model average of 17.3. Nevertheless, during the 2005 recalibration, the pupil teacher ratio of 16 was deemed to signify elementary class size and was enacted into the Legislature's funding model leading to the total of 21.6 teachers resourced for a 288-student prototypical elementary school.

---

[2] This is computed as follows: A 288 student K-5 three section school has 48 students per grade. Dividing 48 students by a pupil teacher ratio of 15 generates 3.2 teaching positions for grades K-3 and dividing 48 by 25 generates 1.92 teachers in grades 4 and 5 for a total of 16.64 teachers compared to 18 teachers in the prototypical Wyoming elementary school.

The table below shows how the number of teachers (core and specialist) actually hired in Wyoming elementary schools in 2012-13 compared to the number of teachers generated for those schools in the Legislature's funded model. An analysis of all schools in Wyoming follows the analysis of middle and high schools in the next section below.

The table shows that Elementary schools in Wyoming employ 501.4 fewer core and specialist teachers than are funded through the funding model. As a result, it is likely that average class sizes in elementary schools exceed the model goal of 16. The WDE points out in its analysis that the difference between the model and district employed teachers shrunk by 65 teachers from 2011-12 to 2012-13, suggesting that the Legislature's mandate that elementary class size be limited to 16 has had an impact on resource allocation at elementary schools.

Comparison of Number of Teachers (Core and Specialist) in Wyoming Elementary Schools Compared to Number of Teachers (Core and Specialist) Funded through the Wyoming Funding Model: 2012-2013

Elementary School Size Category	Number of Schools	Average ADM Per School	Difference in Number of Teachers From Wyoming Funding Model
Small (<= 49 ADM)	35	17	(33.5)
Mid-size (>49 and <=96 ADM)	9	70	3.0
Large (> 96 ADM)	149	297	(471.0)
All Elementary Schools	193	236	(501.4)

Source: *Continued Review of Educational Resources in Wyoming 2005-06 Through 2012-13.* Wyoming Department of Education, October 2013. Hereinafter referred to as CRERW.

3. Secondary Core Teachers/Class Size

In middle and high schools, core teachers are those who teach core subjects such as mathematics, science, language arts, social studies and world language. Advanced Placement classes in these subjects are considered core classes.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference*	Current EB Recommendation
Grades 6-12: 25	Grades 6-12: 21	$28,980,771	No change from 2010 recommendation. Recalibrate

**Because specialist teachers are generated as a percentage of the number of core teachers, the cost difference presented in this table includes the difference between consultant recommendations and current practice for both core AND specialist teachers.*

Analysis and Evidence

There is less research evidence on the most effective class sizes in grades 4-12 than there is on effective class size in grades K-3. As a result, in developing the EB model, we seek evidence on the most appropriate secondary class size from typical and best practices to identify the most appropriate class size for these grades. The national average class size in middle and high schools is roughly 25, and nearly all comprehensive school reform models were developed on the basis of a class size of 25 (Odden, 1997a; Stringfield, Ross & Smith, 1996) a conclusion on class size reached by the dozens of experts who created these whole-school design models. Although many professional judgment panels in many states have recommended secondary class sizes of 20, none cited research or best practices to support that proposal.

Citing more recent studies, Whitehurst and Chingos (2011) argue that there might be a modest linear relationship in improving student performance when class size drops from between 25 and 30 students to 15, but our view of the evidence and impact is that the gains identified are modest at best, and insufficient to alter the EB class size formulas.

Resource Use Analysis

The cost-based model middle and high school class size of 25 is larger than the Legislature's funding model class size of 21. As described above, our understanding is that the use of class sizes of 21 in these grades came from the original adequacy study conducted by MAP and that it was intended as a "staffing ratio" for secondary schools. That is the ratio of 21 students per teacher was intended to include all teaching staff and did not distinguish between core teachers and elective teachers. If one assumes that 21 is a "staffing ratio" and includes core and elective teachers, and if one further assumes that each teacher provides instruction for five of six instructional hours of the regular school day, then the staffing ratio of 21 translates to a core class size of about 25.2, essentially equal to the EB ratio of 25. But the EB model and the Wyoming cost-based model add 20 percent more teachers to this core staffing for middle schools and 33.33 percent more teachers for high schools. As a result, both the generic EB model and the cost-based model provide more teacher resources than the MAP model. Further, during the 2005 recalibration, the class size of 21 was deemed to signify secondary class size and was enacted into the Legislature's funded model, which was further enhanced by elective teachers. So both the cost-based model and the Legislature's funded model provide more teacher resources for secondary schools than did the MAP model.

The table below displays the difference in the number of teachers generated by the Legislature's funding model and the number of teachers actually employed by school districts in middle and high schools. Data are presented for all middle and all high schools as well as by school size categories. It is interesting to note that at the middle school level, regardless of the size of the school, districts employ fewer teachers than the model allocates to middle schools. On the other hand, except for the eight mid-sized high schools, districts employ more high school teachers than the model generates. Specifically across all middle schools in Wyoming there are 26.1 fewer teachers than the model funds and at high schools, there are 13.4 more teachers than the model funds. These numbers are relatively small compared to the total of 501.4 fewer teachers employed at the elementary level.

Comparison of Number of Teachers (Core and Specialist) in Wyoming Secondary (middle and high) Schools Compared to Number of Teachers (Core and Specialist) Supported by the Legislature's Funding Model: 2012-2013

Secondary School Size Category	Number of Schools	Average ADM Per School	Difference in Number of Teachers From Wyoming Funding Model
Middle Schools			
Small (<= 49 ADM)	8	20	(6.2)
Mid-size (>49 and <=105 ADM)	9	69	(8.7)
Large (> 105 ADM)	42	398	(11.2)
All middle Schools	59	297	(26.1)
High Schools			
Small (<= 49 ADM)	7	32	2.1
Mid-size (>49 and <=105 ADM)	8	82	(5.6)
Large (> 105 ADM)	39	551	16.9
All High Schools	54	414	13.4

Source: CRERW

4. Elective/Specialist Teachers

In addition to core classroom teachers, the EB model provides elective or specialist teachers to support core teachers. Generally, non-core or elective teachers, also called specialist teachers, offer courses in such subjects as music, band, art, physical education, health, career-technical education, etc. A combination of core and elective teachers allows time during the school day for all teachers to collaborate on instructional plans, participate in professional development activities and otherwise plan for class instruction.

Elementary School Elective Teachers			
2010 EB Recommendation	**Current Wyoming Policy**	**Cost Difference**	**Current EB Recommendation**
20% of core elementary teachers	20% of core elementary teachers	$0	No change from 2010 recommendation. No need for a formal recalibration.

Middle School Elective Teachers			
2010 EB Recommendation	**Current Wyoming Policy**	**Cost Difference***	**Current EB Recommendation**
20% of core middle school teachers	33 1/3 % of core middle school teachers.	$8,151,402	No change from 2010 recommendation. Recalibrate

High School Elective Teachers			
2010 EB Recommendation	**Current Wyoming Policy**	**Cost Difference**	**Current EB Recommendation**
33 1/3 % of core high school teachers	33 1/3 % of core high school teachers.	$0	No change from 2010 recommendation. No need for a formal recalibration.

**Because specialist teachers are generated as a percentage of the number of core teachers, the cost difference presented in this table includes the difference between consultant recommendations and current practice for both core AND specialist teachers.*

Analysis and Evidence

In addition to the core subjects addressed above, schools need to provide a solid well-rounded curriculum including art, music, library skills and physical education. Teachers also need some time during the regular school day to work collaboratively and engage in job-embedded professional development. Providing every teacher one period a day for collaborative planning and focused professional development requires an additional 20 percent allocation for elective teachers. Using this elective staff allocation, every teacher – core and elective – would teach 5 of 6 periods during the day, and have one period for planning, preparation and collaborative work. One of the most important elements of effective collaborative work is team-focused data-based decision making, using student data to improve instructional practices, now shown to be effective by a recent *randomized controlled trial* (Carlson, Borman & Robinson, 2011).

The 20 percent additional staff is adequate for elementary and middle schools, but the EB approach established a different argument for high schools. If the goal is to have more high school students take a core set of rigorous academic courses, and learn the course material at a high level of thinking and problem solving, cognitive research findings suggest that use of longer class periods, such as a block schedule, is a better way to organize the instructional time of a high school. (Bransford, Brown and Cocking, 1999; Donovan & Bransford, 2005a, 2005b, 2005c). Typical block scheduling for high schools includes four 90-minute blocks where teachers provide instruction for three of those 90-minute blocks and have one block – or 90 minutes – for planning, preparation and collaboration each day. This schedule requires elective teachers at a rate of 33 1/3 percent of the number of core teachers. This block schedule would operate with students taking four courses each semester attending the same classes each day, or with students taking eight courses each semester while attending different classes every other day. Such a schedule could also entail a few "skinny" blocks (45 minute periods) for some classes. Each of these specific ways of structuring a block schedule, however, would require an additional 33 1/3 percent of the number of core teachers to serve as elective teachers to provide the regular teacher with a "block" for planning, preparation and collaboration each day.

It should be noted that this staffing recommendation for high schools would be sufficient for high schools to provide all students with a rigorous set of courses throughout grades 9-12, and an appropriate number of credits required for high school graduation to quality for Hathaway scholarships or be college ready for any post-secondary institution in the country.

We point out that the elective teacher recommendation described above does not provide sufficient resources, at the same class sizes, for either middle schools or high schools to offer a 7 period day and require teachers to instruct for only 5 of those periods. The EB model does not resource schools at that level for two primary reasons. First, the EB model formulates recommendations on strategies and resources to dramatically improve student performance in the core subjects of reading/English/language arts, mathematics, science, history/geography and world language, in part by providing nearly an hour of instruction in each of these subjects daily. Restructuring the day to add a seventh period is usually accomplished by reducing the minutes of instruction in core subjects, and thus is not a strategy that is likely to boost performance in those subjects, regardless of the arguments about the motivational aspects of elective classes. Second, increasing the provision of specialist and elective teachers to 40 percent in both middle and high schools is more costly. Therefore, a recommendation of 40 percent specialists and elective teachers in secondary schools would result in added costs and a potential decrease in instructional effectiveness for the core subjects, something that is not aligned with the framework for the EB approach to adequacy.

Nevertheless, the Legislature's funding model provides elective teachers for middle schools at the same rate as for high schools – 33 1/3 percent of core teachers – and thus exceeds the EB, cost-based model recommendations.

Resource Use Analysis

The analysis of core teachers includes a comparison of the number of teachers in Wyoming with the number of teachers allocated to school districts through the Wyoming Funded Model. That analysis showed a substantial number of teacher positions that were funded but not filled as teachers by the state's 48 school districts. Additionally, that analysis only included what we termed "traditionally organized" schools. There are a number of other school types in Wyoming that should be considered. In this analysis we provide information on teachers in other (not traditionally organized) schools, as well as statewide total data for the allocation of teachers across the districts.

The table below summarizes the differences between the number of teachers (core and specialist) generated by the Legislature's funding model and the number of teachers employed by the school districts by types of school other than Elementary, Middle and High School – using the definitions of school types used by the WDE in the CRERW report. In all four types of schools, there are substantially fewer teachers than generated by the Legislature's funding model. This likely occurs because of the large number of minimum teachers the model provides for small schools that include multiple school types. In addition to the minimums, the model funds positions on the basis of the type of school represented by the highest grade in the school – and in the case of some 7-12 secondary schools, provides the minimum number of teachers for both middle AND high schools.

Comparison of Number of Teachers (Core and Specialist) in Wyoming (non-traditionally organized) Schools Compared to Number of Teachers (Core and Specialist) Funded through the Wyoming Funding Model: 2012-2013

School Size Category	Number of Schools	Average ADM Per School	Difference in Number of Teachers From Wyoming Funding Model
K-12	8	149	(15.7)
K-8	13	85	(12.6)
Secondary	8	169	(25.4)
Alternative	16	54	(39.8)

Source: CRERW

Statewide, the Legislature's funding model funded 6,707.6 core and specialist/elective teaching positions, while districts employ 6,100.1 teachers in 2012-13 a difference of 607.5 teaching positions. Among the state's 48 districts, 35 employ fewer teachers and 13 employ more teachers than the model funds.

Although the number of teachers in districts has been lower than the number of teachers allocated through the Legislature's funding model for all years since 2005-06, the difference has fluctuated somewhat since that time. The table below displays the number of teachers allocated by the model, the number employed, the difference, and the number employed as a percentage of allocated teachers for each year between 2008-09 and 2012-13. The table shows that districts have consistently employed about 90% of the number of teachers funded by the Wyoming funding Model.

Comparison of Number of Teachers (Core and Specialist) in Wyoming Schools Compared to Number of Teachers (Core and Specialist) Funded through the Wyoming Funded Model: 2008-09 through 2012-2013

Year	Number of Teachers Allocated in the Model	Number of Teachers Employed by Districts	Difference (Allocated minus Actual)	Actual as a Percent of Teachers Allocated in the Model (%)
2008-09	6,430.00	5,865.00	-565.00	91.21%
2009-10	6,416.30	5,933.00	-483.30	92.47%
2010-11	6,576.60	5,915.00	-661.60	89.94%
2011-12	6,633.60	5,977.10	-656.50	90.10%
2012-13	6,707.60	6,100.10	-607.50	90.94%

One possible reason districts have fewer teachers than funded through the model may be that they pay teachers higher salaries than the model provides. The table below shows the annual disparity between average district salaries and the salaries funded through the Legislature's funding model. The table clearly shows that over the years since the Legislature's funding model was implemented, districts have paid teachers between $5,000 and $6,000 more per year than they receive in funding.

District Average Teacher Salaries Compared to Model Funding: 2005-06 to 2012-13

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
District Average Regular Salary	$43,464	$50,892	$52,943	$54,541	$55,779	$56,048	$56,734	$56,740
Funding Model Average Salary		$45,126	$46,840	$48,854	$50,662	$50,662	$50,662	$50,662
Difference		$5,766	$6,103	$5,687	$5,117	$5,386	$6,072	$6,078
% Difference		12.8%	13.0%	11.6%	10.1%	10.6%	12.0%	12.0%

Source: CRERW

A district-by-district analysis of the difference between teacher salaries used in the Legislature's funding model and actual salaries paid to teachers by school districts shows that 40 of 48 districts pay teachers more than the funding provided through the Legislature's funding model. On average, districts spent 106% of the Legislature's funding model salary allocation, with a high of 127% of model salary to a low of 88% of the model salary for teachers. In dollar terms, this ranged from $13,422 more than the model provided in one district to $6,252 less in another district. [3]

[3] It is important to note that the Legislature's funding model adjusts the average salary per teacher payment it makes to each district based on the average education and experience of the teaching staff in the district and is further adjusted for regional differences.

5. Additional Vocational/Career Technical Teachers

The Legislature's funding model provides additional staffing to school districts for vocational/CTE educational programs. The table below summarizes the current status of Vocational/CTE funding.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
No additional vocational education teachers resourced.	Apply an additional weighting factor of 29 percent to vocational education student FTEs. Based upon weighted student count, provide an additional teacher for every 21 students.	$2,057,916	No change from 2010 recommendation. Recalibrate

Discussion of this item can be found for Model Component 20, Vocational Education/Career Technical supplies and materials. The EB model does not recommend any additional teachers for vocational education/career technical education courses because Wyoming's secondary class sizes are already small, resourced at a class size of 21.

6. Minimum Teachers

As mentioned above, one important issue is how to staff schools with enrollments smaller than that of a one-unit prototype school – 96 elementary students and 105 middle and high school students. Schools with 49 or fewer students are provided 1 assistant principal position and 1 teacher for every 7 students. It is for schools with between 49 and either 96 or 105 students that minimum teacher allocations are included in the model.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
A minimum of 3.65 teachers provided for elementary schools, a minimum of 7 teachers for middle schools and high schools with ADM greater than 49. Resourced at the highest grade band level. For schools 49 & below,	A minimum of 6 teachers provided for elementary school grade bands with ADM greater than 49. A minimum of 8 teachers provided for middle school grade bands with ADM greater than 49. A minimum of 10	$14,337,242	No change from 2010 recommendation. Recalibrate

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
minimum teacher resources are provided on a prorated basis at 1 teacher for every 7 students.	teachers provided for high school grade bands with ADM greater than 49. For school grade bands of 49 & below, minimum teacher resources are provided on a prorated basis at 1 teacher for every 7 students.		

Evidence and Analysis

In the 2005 recalibration, for schools with fewer than 96 students at the elementary level, and 105 students at the secondary level, it was recommended that staffing be simply pro rated down from the staffing of a one unit (96 or 105 student) school. It was argued, particularly for elementary schools, that this provided sufficient staffing if schools organized classrooms with students of different ages. For elementary schools, it was even argued that multi-age classrooms could be a more effective way to organize classrooms (for example, see Decotis & Tanner (1995), Gutierrrez and Slavin (1992), Slavin (1987) and Pavan (1992)). In response, the Wyoming education community argued that it preferred to have one teacher per grade for these small schools. The Legislature agreed with these arguments and the Legislature's funding model provides for minimum teacher allocations that are higher than the cost based model.

In addition to the minimum number of teachers at each school, there is a "Small District Adjustment," which requires that districts with 243 or fewer ADM receive a minimum of one teacher for every grade level, or at least 13 teachers.

Resource Use Analysis

The state collects data comparing the number of teachers allocated through the Wyoming Funding Model with the number employed at the district as well as the school level (see the sections above on core and specialist teachers (sections 3 and 4). But the analysis of resource use focused mainly at the district level. Consequently, it is not possible to ascertain whether or not the number of teachers at individual schools with enrollments between 49 and either 96 (elementary) or 105) (secondary) employ more or fewer teachers than allocated through the Legislature's funding model. This more detailed analysis should be considered for the next recalibration.

As shown above, in 2012-13 school districts employed 607.5 fewer teachers than allocated through the Legislature's funding model, which suggests the possibility that these small schools have fewer teachers than the minimum allocated.

7. Instructional Facilitators/Coaches

Coaches, or instructional facilitators, coordinate the instructional program but most importantly provide the critical ongoing instructional coaching and mentoring that the professional development literature shows is necessary for teachers to improve their instructional practice (Cornett & Knight, 2008; Crow, 2011; Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Calhoun, 1996; Joyce & Showers, 2002). This means that they spend the bulk of their time with teachers, modeling lessons, giving feedback to teachers, working with teacher collaborative teams, and generally helping to improve the instructional program. The few instructional coaches who also function as school technology coordinators provide the technological expertise to fix small problems with the computer system, install software, connect computer equipment so it can be used for both instructional and management purposes, and provide professional development to embed computer technologies into a school's curriculum. This report expands on the rationale for these individuals in the section on professional development (Element 16), but includes them here as they represent teacher positions.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
1.5 instructional facilitator/coaches for prototypical elementary (288 ADM) and secondary (315 ADM) schools.	Funded outside block grant in a categorical grant equal to 60 percent of consultant recommendation	-$13,760,799	No change from 2010 recommendation. Recalibrate

Analysis and Evidence

Only a few states (e.g., Arkansas, New Jersey, Wyoming and to a modest degree North Dakota) explicitly provide resources for school and classroom-based instructional coaches, yet instructional coaches are key to making professional development work (see Element 16). Most comprehensive school designs (see Odden, 1997; Stringfield, Ross & Smith, 1996), and EB studies conducted in other states – Arizona, Arkansas, Kentucky, Maine, North Dakota, Washington and Wisconsin – call for school-based instructional facilitators or instructional coaches (sometimes called mentors, site coaches, curriculum specialists, or lead teachers).

Early research found strong effect sizes (1.25-2.71) for coaches as part of professional development (Joyce & Calhoun, 1996; Joyce & Showers, 2002). A 2010 evaluation of a Florida program that provided reading coaches for middle schools found positive impacts on student performance in reading (Lockwood, McCombs & Marsh, 2010). A related study found that coaches provided as part of a data-based decision making initiative also improved both teachers' instructional practice and student achievement (Marsh, McCombs & Martorell, 2010).

More importantly, a *randomized controlled trial* of coaching (Pianta, Allen & King, 2011) found significant, positive impacts in the form of student achievement gains across four subject areas – mathematics, science, history, and language arts. This gold standard of research provides further support to this element as an effective strategy to boost student learning.

In terms of numbers of coaches, several comprehensive school designs suggest that although one instructional coach might be sufficient for the first year of implementation of a school-wide program, additional instructional coaches are needed in subsequent years. Moreover, several technology-heavy school designs recommend a full-time facilitator who spends at least half-time as the site's technology expert. Thus, drawing from all programs, we conclude that 1.0 FTE instructional coaches/technology coordinators are needed for every 200 students in a school. This resourcing strategy works for elementary as well as middle and high schools. In Wyoming, this recommendation equates to 1.5 instructional coaches for each prototypical elementary (288 students), middle and high school (315 students).

Although instructional coaching positions are identified as FTE positions, schools could divide the responsibilities across several individual teachers. For example, the 3.0 positions in a 630-student high school could be structured with six half-time teachers and instructional coaches. In this example, each teacher/coach would work 50 percent time as a coach – perhaps in one curriculum area such as reading, math, science, social studies and technology – and 50 percent time as a classroom teacher or tutor.

We note that this level of staffing for coaches, combined with the additional elements of professional development discussed below, focus on making Tier 1 instruction (in the Response to Intervention frame) as effective as possible, providing a solid foundation of high quality instruction for everyone, including students who struggle more to learn to proficiency.

Resource Use Analysis

In 2012-13 the Wyoming Funding Model allocated a total of 238.4 facilitator positions to the state's school districts. The districts employed 213.5 facilitators or 24.9 fewer than allocated through the model. Expenditures for facilitators are included in the analysis of professional development in Element 16 below, although it should be noted that the CRERW report also shows expenditures of almost $2.2 million from general funds for facilitators in eight school districts.

Instructional coaches are a critical part of successful professional development for teachers. With the shift to college and career ready standards requiring substantial change in teachers' instructional practice, we argue here that the Legislature needs to consider strategies the provide incentives for school districts to hire and use more instructional coaches. If schools are to boost the achievement curve, teachers' instructional practice must become more effective, a task that is aided by using more instructional coaches as recommended in the cost-based model.

8. Core Tutors/Tier 2 Intervention

The most powerful and effective approach for helping students struggling to meet state standards is individual one-to-one or small group (1-3 or 1-5 maximum) tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). In our 2005 and 2010 reports we recommended allocation of tutors to schools on the basis of the number of at-risk students. Since that time, we have recognized that all schools, even those with no at-risk students, have struggling students that need Tier 2 resources. Thus, we have modified the EB model so that each prototypical school receives at least one tutor regardless of the number of at-risk students. *Consequently, we identify tutor resources a school receives under the current EB model here in the core staffing section and also discuss the need for more tutors in Element 26 below.*

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
Tutor positions provided on basis of at-risk student count, with a minimum of 1.0 for each school prototype.	Tutor positions provided on basis of at-risk student count, with a minimum of 1.0 for each school prototype.	$0	One tutor position in each prototypical school* Recalibrate This is a new EB (cost-based) recommendation.

* Additional tutors are enabled through the at-risk pupil count in Element 26.

Analysis and Evidence

The most powerful and effective extra help strategy to enable struggling students to meet state college and career ready standards is individual one-to-one tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). Students who must work harder and need more assistance to achieve to proficiency levels especially benefit from preventative tutoring (Cohen, Kulik, & Kulik, 1982). Tutoring program effect sizes vary by the components of the approach used, e.g. the nature and structure of the tutoring program, but effect sizes on student learning reported in meta-analyses range from 0.4 to 2.5 (Cohen, Kulik & Kulik, 1982. Shanahan, 1998; Shanahan & Barr, 1995; Wasik & Slavin, 1993) with an average of about 0.75 (Wasik & Slavin, 1993).

The impact of tutoring programs depends on how they are staffed and organized, their relation to the core program, and tutoring intensity. Researchers (Cohen, Kulik, & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) have found greater effects when the tutoring includes the following:

- Professional teachers as tutors
- Tutoring initially provided to students on a one-to-one basis
- Tutors trained in specific tutoring strategies
- Tutoring tightly aligned to the regular curriculum and to the specific learning challenges, with appropriate content specific scaffolding and modeling

- Sufficient time for the tutoring
- Highly structured programming, both substantively and organizationally.

We note several specific structural features of effective one-to-one tutoring programs:

- First, each tutor would tutor one student every 20 minutes, or three students per hour. This would allow one tutor position to tutor 18 students a day. (Since tutoring is such an intensive activity, individual teachers might spend only half their time tutoring; but a 1.0 FTE tutoring position would allow 18 students per day to receive 1-1 tutoring.). Four positions would allow 72 students to receive individual tutoring daily in the prototypical elementary and middle schools.
- Second, most students do not require tutoring all year long; tutoring programs generally assess students quarterly and change tutoring arrangements. With modest changes such as these, close to half the student body of a 400-student school unit could receive individual tutoring during the year.
- Third, not all students who are from a low-income background require individual tutoring, so a portion of the allocation could be used for students in the school who might not be from a lower income family but nevertheless have a learning issue that could be remedied by tutoring. This also is part of the rationale for including 1 tutor in each prototypical school, regardless of the number of at-risk students.

Though this discussion focuses on *individual* tutoring, schools could also deploy these resources for small group tutoring. In a detailed review of the evidence on how to structure a variety of early intervention supports to prevent reading failure, Torgeson (2004) shows how one-to-one tutoring, one-to-three tutoring, and one-to-five small group sessions (all Tier 2 interventions) can be combined for different students to enhance their chances of learning to read successfully.

One-to-one tutoring would be reserved for the students with the most severe reading difficulties, scoring say, at or below the 20th or 25th percentile on a norm referenced test, or at the below basic level on state achievement tests. Intensive instruction for groups of three-to-five students would then be provided for students above those levels but below the proficiency level.

It is important to note that the instruction for all student groups needing extra help needs to be more explicit and sequenced than that for other students. Young children with weakness in knowledge of letters, letter sound relationships and phonemic awareness need explicit and systematic instruction to help them first decode and then learn to read and comprehend. As Torgeson (2004:12) states:

> Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own. For example, explicit instruction requires teachers to directly make connections between letters in print and the sounds of words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group of high at-risk children in kindergarten, first grade and second grade …..only the most [phonemically] explicit intervention produced a reliable increase in the growth of word-reading ability …

> schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire work-reading skills at grade level by the third grade …. Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text…. Finally, it requires not only direct practice to build fluency…. but also careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning.

Torgeson (2004) goes on to state that meta-analyses consistently show the positive effects of reducing reading group size (Elbaum, Vaughn, Hughes & Moody, 1999) and identifies experiments with both one-to-three and one-to-five teacher-student groupings. Though one-to-one tutoring works with 20 minutes of tutoring per student, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes. The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, a one FTE reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group, and 30+ students a day in the one-to-five setting with 45 minutes of instruction per group. Four FTE tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though we have emphasized 1-1 tutoring, and some students need 1-1 tutoring, other small group practices (which characterize the bulk of Tier 2 interventions) can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) states that similar interventions can work with middle and high school students, the effect often is smaller as it is much more difficult to undo the lasting damage of not learning to read when students enter middle and high schools with severe reading deficiencies. However, a new randomized control study (Cook et al., 2014) discussed next found similarly positive impacts of a tutoring program for adolescents in high poverty schools if it was combined with counseling as well. This is made possible in the EB model as it includes such additional non-academic pupil support resources (see Element 27 discussion).

The rationale outlined above is strengthened by two recent *randomized controlled trials* of the effectiveness of tutoring for struggling students, which support our logic for providing a minimum level of tutor support in all schools as well as additional tutors for schools with greater need. At the elementary level, May et al., (2013), using a randomized controlled trial, assessed the impact of tutors in a Reading Recovery program. In the third year of a five-year evaluation, they found that Reading Recovery tutoring had an effect size of 0.68 on overall reading scores relative to the population of students eligible for such services in the specific study, and a 0.47 effective size relative to the national population of first grade struggling readers. The effects were similarly large for reading words and reading comprehension sub-scales.

For students in high schools, Cook, et al. (2014) reported on a *randomized controlled trial* of a two-pronged intervention that provided disadvantaged youth with tutoring *and* counseling. They found that intensive individualized academic extra help – tutoring – combined with non-academic supports seeking to teach grade 9 and 10 youth social-cognitive skills based on the principles of cognitive behavioral therapy (CBT), led to improved math and reading performance. The study sample consisted mainly of students from low income and minority backgrounds, which generally pose the toughest challenges. The effect size for math was 0.65 and for reading was 0.48; the combined program also appeared to increase high school graduation by 14 percentage points (a 40 percent hike). The authors concluded that this intervention seemed to yield larger gains in adolescent outcomes per dollar spent than many other intervention strategies.

These studies are highlighted for several reasons. First, they represent new, *randomized controlled trials*, the "gold standard" of research supporting the efficacy of tutoring. Second, they show that tutoring can work not only for elementary but also for high school students, whereas most of the tutoring research addresses elementary-aged students. Third, they show that tutoring can work even in the most challenging educational environments. And fourth, they bolster the EB argument below that extra help resources in schools triggered by poverty/at-risk status should also include some non-academic, counseling resources as well, as the treatment in the second study was tutoring combined with a counseling.

In our 2005 and 2010 reports, we recommended tutor positions be provided only on the basis of at-risk student counts. The recommended ratio was one position for every 100 at-risk students but with a minimum of one for each prototypical school. As a result, a school without any at-risk students would receive the minimum of one tutor position for struggling students, but a school with 100 at-risk students would receive the same single tutor, even though it might have more need for tutor resources. Today educators and policymakers across the country argue that schools with few low-income students still have students who struggle to learn to proficiency, and that more rigorous college and career ready standards will lead to greater numbers of struggling students in the future. We find those arguments convincing and have modified the EB recommendations for tutoring resources.

The revised EB model provides one tutor/Tier 2-intervention position in each prototypical school. In parallel with that change, the EB model adjusts the ratio for additional tutor positions to one position for every 125 at-risk students. The additional support beyond the first tutor per prototypical school is discussed again in Section 26 (struggling students) below.

The new EB recommendation for tutor/Tier 2-intervention positions is more generous than the previous recommendation of 1/100 at-risk students with a minimum of one for each prototypical school. For example, under the old EB model, a prototypical school with no at-risk students would receive one position, as would a prototypical school with 100 at-risk students. The revised EB model calls for 1.0 position at a school with no at-risk students. For school with 100 at-risk students, the model provides 1.0 tutor positions plus an additional 0.8 (100/125) position for the 100 at-risk students, for a total of 1.8 positions.

That analysis shows that district practices with respect to tutors is not aligned with the Legislative funding model, i.e., districts use fewer tutors or Tier 2 interventionists than the model provides. Since extra help for struggling students is critical to educate all students to proficient or higher performance levels, the resources for such extra help should be fully utilized. During the 2015 recalibration, the Legislature should consider incentives for districts to provide struggling students extra help. Holding performance standards constant and varying instructional time is a key strategy for ensuring all students are able to meet higher standards.

9. Substitute Teachers

Schools need some level of support for substitute teachers to cover classrooms when teachers are sick for short periods of time, absent for other reasons, or on long term leave. In many other states, substitute funds are budgeted at a rate of about 10 days per teacher. The cost-based model approach of providing funding equal to five percent of the cost of teacher salaries approximates that 10-day figure.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
5 % of core and elective teachers, instructional coaches, tutors (and teacher positions in extended day, summer school and ELL).	5 % of core and elective teachers, instructional coaches, tutors (and teacher positions in extended day, summer school and ELL).	$0	No change from 2010 recommendation. No need for a formal recalibration.

Analysis and Evidence

Five percent of a teacher work year equals approximately 10 days, so this provisions provides up to ten days of substitute teacher resources for each teacher. This approach does not mean that each teacher is provided ten substitute days a year; it means the district receives a “pot” of money approximately equal to 10 substitute days per year for all teachers, in order to cover classrooms when teachers are absent for reasons other than professional development. Professional development recommendations are fully developed in a separate section below (Element 13).

Resource Use Analysis

The Wyoming Funding Model allocated $6.7 million to school districts for substitutes in school year 2012-13. Data on actual district expenditures for substitute teachers are not collected by the WDE.

10. Core Guidance Counselors and Nurses

The EB approach has been modified to provide guidance counselor and nurse positions in the core program, and to provide additional pupil support positions (e.g., social workers and family liaison persons) on the basis of at-risk student counts as described in Element 27 below.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
1 guidance counselor position for every 250 middle and high school students	1 guidance counselor position for every 250 middle and high school students	$0	1 guidance counselor for every 288 grade K-5 students 1 guidance counselor for every 250 grade 6-12 students* 1 nurse for every 750 K-12 students Recalibrate This is a new EB recommendation.

* Additional student support resources are provided on the basis of student at-risk student in Element 27.

Analysis and Evidence

Schools need guidance counselors and nurses. For guidance counselors, the EB model uses the standards from the American School Counselor Association (ASCA). Those standards recommend one counselor for every 250 secondary (middle and high school) students. This produces 1.26 pupil support positions for a 315-student prototypical middle school and 2.52 pupil support positions for a 630-student prototypical high school.

Today many states require guidance counselors in elementary schools as well. Moreover, even in states that do not require counselors at the elementary level, a growing number of elementary schools have begun to employ these personnel. Consequently, the EB model has been modified in recent years to include a minimum of one guidance counselor for a prototypical elementary school. As a result, we recommend recalibration of the Wyoming Funding Model to include a minimum of one guidance counselor position for each prototypical elementary school. The EB model provides additional pupil support personnel to schools on the basis of at-risk student counts as described in Element 27 below.

The physical and medical needs of students also have changed dramatically over the past several years. Many students need medications during the school day. School staff are often required to administer these medications. Many students have additional medical or physical needs and our experience in several states suggests that these needs have been growing over the past decade. Consequently, the EB model has been enhanced to provide nurses as core positions. Drawing from the staffing standard of the National Association of School Nurses, the EB model now provides core school nurses at the rate of 1 FTE nurse position for every 750 students, prorated up and down without any minimum.

Resource Use Analysis

The CRERW report combines guidance counselors, nurses and other support personnel into one pupil support category to compare model staffing to actual staff allocations in the districts. In addition, because in some districts some of these personnel are reported at the district, rather than the school level, two comparisons are provided – one for school and district level differences and one for school level differences.

The dual reporting is a result of many school districts assigning pupil support personnel to multiple schools and then accounting for them as district level, rather than school level staff positions. In recent years, the WDE has worked with districts to assign the FTE of these personnel to their respective schools, and for the most part, the districts have made such assignments. However, a few districts continue to report some positions at the district level. Consequently, both school level and district and school level staff allocations are reported here.

In 2012-13, the Wyoming Funding Model allocated a total of 538.1 pupil support positions across the state. Districts reported a total of 494.9 school and district level pupil support positions filled, 43.2 fewer then generated by the model. Across the state, a total of 487.0 pupil support positions were reported at the school level, a difference of 51.1 from the 538.1 positions funded through the model. This shows that today, only 7.9 pupil support positions across the state are reported as district level staff.

An analysis of individual district pupil support staffing shows that 19 districts employ fewer pupil support staff than are funded through the model while 29 have more pupil support staff than are funded through the model.

11. Supervisory and Instructional Aides

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
Provide funding at an amount equal to 2.0 FTE positions for 288 ADM prototypical elementary school; 2.0 FTE for 315 ADM prototypical middle school; 5.0 FTE for 630 ADM prototypical high school; resourced at the highest-grade prototype using total school ADM.	Provide funding at an amount equal to 2.0 FTE positions for 288 ADM prototypical elementary school; 2.0 FTE for 315 ADM prototypical middle school; 5.0 FTE for 630 ADM prototypical high school; resourced at the highest-grade prototype using total school ADM.	$0	2 for prototypical elementary school 2.0 for prototypical middle school of 315 3 for prototypical high school of 630 Resourced at the highest-grade prototype using total school ADM. Recalibrate

Analysis and Evidence

Elementary, middle and high schools need staff for responsibilities that include lunch duty, hallway monitoring, before and after school playground supervision, and others. Covering these duties generally requires an allocation of supervisory aides at about the rate of 2.0 FTE aide positions for a school of 400-500 students.

However, research does not support the use of instructional aides for improving student performance. As noted above (Element 2), the Tennessee STAR study, which produced solid evidence through field-based *randomized controlled trials* that small classes work in elementary schools, also produced evidence that instructional aides in a regular-sized classroom do not add instructional value, i.e., do not positively impact student achievement (Gerber, Finn, Achilles & Boyd-Zaharias, 2001).

At the same time, districts may want to consider a possible use of instructional aides that is supported by research. Two studies that show how instructional aides could be used to tutor students. Farkas (1998) has shown that if aides are selected according to clear and rigorous literacy criteria, are trained in a specific reading tutoring program, provide individual tutoring to students in reading, and are supervised, then they can have a significant impact on student reading attainment. Some districts have used Farkas-type tutors for students still struggling in reading in the upper elementary grades. Another study by Miller (2003) showed that such aides could also have an impact on reading achievement if used to provide individual tutoring to struggling students in the first grade.

We note that neither of these studies supports the typical use of instructional aides as general teacher helpers. Evidence shows that instructional aides can have an impact but only if they are selected according to educational criteria, trained in a specific tutoring program, deployed to provide tutoring to struggling students, and closely supervised.

Resource Use Analysis

The Wyoming Funding Model includes resources for 624.8 supervisorial aides across the state, while school districts actually employed 831.9 aides, a total of 207.1 more than funded through the model. Half of the districts have more aides than allocated through the model, half have fewer.

The CRERW shows that the average salary paid to aides by school districts in 2012-13 was $22,326, some $3,880 more than the model funded level of $18,446.

It is not clear from the CRERW report to what extent, if any, these aid positions are used as instructional aides in classrooms. In our School Use of Resources studies following the 2005 recalibration, we found a number of schools where instructional aides were employed, but we do not have evidence of how aides are used in schools today, nor whether aides employed as instructional aides have the training and experience that Farkas found can help improve student reading attainment.

12. Librarians and Librarian Media Technicians

Most schools have a library, and the staff resources must be sufficient to operate the library and to incorporate appropriate technologies into the library system.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
Fund at the district level rather than school level. For districts with 0-300 ADM, provide funding for 1 librarian and 1 library clerk. For districts with 301-630 ADM, prorate from the 300 ADM level up to 2 librarians, but retain the 1 librarian clerk for the 630 ADM. Above 630 ADM, 1 librarian for every 288 elementary ADM and 1 librarian and 2 library clerks for every 630 secondary ADM, with a minimum of 2 librarians and 1 library clerk. No library media technicians funded, but rather a separate computer technician position in central office.	For non-alternative schools and small schools, provide 1 librarian for the prototypical elementary schools (288 ADM) prorate up and down, below and above 288 ADM. For middle or high schools with ADM between 105 and 630 ADM, 1 librarian. Below 105 prorate down and above 630 prorate. For non-alternative schools and small schools, provide 1 library media technician for every 315 middle and high school ADM, prorated up and down.	\$3,474,482 \$3,034,238 Total Cost Difference \$6,508,720	Fund at the district level, 1 librarian for every 315 K-8 students and 1 librarian for every 630 9-12 students No library media technicians funded under this area – see computer technician section – Element 23 Recalibrate This is a new EB recommendation.

Analysis and Evidence

There is scant research on the impact of school librarians on student achievement. In 2003, however, six states conducted studies of the impacts of librarians on student achievement: Florida, Minnesota, Michigan, Missouri, New Mexico, and North Carolina. And, in 2012 Colorado conducted a statewide study using data from 2005-2011. The general finding is that, regardless of family income, children with access to endorsed librarians working full time perform better on state reading assessments (Rodney, M.J., Lance, K.C. & Hamilton-Rennell, C, 2003; Lance, K.C. & Hofschire, L, 2012). The Michigan study found that regardless of whether the librarian was endorsed, student achievement was better for low-income children, but having an endorsed librarian was associated with higher achievement than having an unendorsed librarian (Rodney, M.J., Lance, K.C. & Hamilton-Rennell, C, 2003). Each state examined the issue differently, but library staffing and the number of operating hours were generally associated with higher academic outcomes. The EB Model recommendation for library staff is derived from best practices in other states, state statutes where they exist and the above research.

Resource Use Analysis

The Wyoming Funding Model allocates 279.9 librarian positions across the state. Districts employed 121.1 librarians (a difference of 158.7) at the school and district level, and 116.0 (a difference of 163.9) at the school only level. See Element 10 (guidance counselors and nurses) for discussion of the difference between school level and district and school level staffing.

The model allocates 134.1 library media tech staff. Districts employ 360.3 of these positions at the district and school level of which only 116.0 are allocated directly to schools by the districts. It is likely that the district level reported staff provides technical support to multiple schools in many districts.

Across the state's 48 districts, 44 employ fewer librarians than allocated by the model while only six employ fewer library media technicians than allocated through the model.

Librarian salaries are funded at the same level as teacher salaries in the model. Library media tech staff are paid an average of $49,284, some $5,784 more than the $43,501 funded in the model.

13. Principals and Assistant Principals

Every school unit needs a principal. There is no research evidence on the performance of schools with or without a principal. All comprehensive school designs, and all prototypical school designs from all professional judgment studies around the country, include a principal for every school unit.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
1.0 principal for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, prorated by ADM below these ADM levels. 1.0 assistant principal for every 288 elementary ADM beginning at 289 ADM; 1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM.	1.0 principal for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, prorated by ADM below these ADM levels. 1.0 assistant principal for every 288 elementary ADM beginning at 289 ADM;1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM.	$0	No change from 2010 recommendation. No need for a formal recalibration.

Analysis and Evidence

There is no research evidence on the performance of schools with or without a principal. Few if any comprehensive school designs for 500 students include assistant principal positions. And very few school systems around the country provide assistant principals to schools with 500 or fewer students. The EB model also recommends that instead of one school with a large number of students, school buildings with large numbers of students be sub-divided into multiple school units within the building, we recommend that each unit have a principal. This implies that one principal would be required for each school unit. The cost-based model provides one assistant principal for the high school largely for discipline and athletics.

Resource Use Analysis

The Legislature's funding model provides resources to employ 417.2 school site administrators (principals and assistant principals). Districts employed a total of 366.8 or 50.4 fewer school administrators than the model resources. Nine districts employ more site administrators than the model funds, 37 employ fewer site administrators than the model funds and two employ the same number of site administrators as resourced through the model.

On average, districts paid principals $7,728 more than the model funds. The average principal salary in 2012-13 was $92,801, some 11.7% more than funded through the model. For assistant principals, the difference was even larger, with the model funding $69,702 for each generated assistant principal position and districts paying 24.1% more, or $86,527. This difference likely occurs because most of the assistant principals are in the larger school districts where salaries are generally higher.

A district-by-district analysis shows that 42 districts paid principals more than the model provided in 2012-13 and six paid less. One district paid principals 142% of the model funding level (the highest percentage difference identified), while the lowest district paid principals 83% of model funding. On a dollar basis, average principal salary exceeded model funding by $31,067 in the district with the largest positive difference, and was $13,621 below the model principal salary in the district with salaries furthest below the model level for principal salaries.

In districts that employed assistant principals, all of them paid higher salaries than the model provided. This ranged from 102% of model funding to 131% of model funding or a difference of between $1,397 and $21,365.

14. School Site Secretarial Staff

Every school site needs secretarial support to provide clerical and administrative support to administrators and teachers, to answer the telephone, greet parents when they visit the school, help with paper work, etc. In the current Wyoming Funding Model secretary positions are distinguished from clerical positions, the fundamental difference being secretaries have a 12-month appointment and clerical staff school year appointments.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
Provide 1.0 secretary for all schools down to 96 ADM for elementary and 105 ADM for middle and high schools, prorated by ADM below these ADM levels.	Provide 1.0 secretary for all schools down to 96 ADM for elementary and 105 ADM for middle and high schools, prorated by ADM below these ADM levels.	$0	Simplify the formula to provide just secretary staff. Provide 2.0 secretary positions for every prototypical elementary school, prorated down to 1.5

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
Provide 1.0 secretary for 105 to 315 middle school ADM, prorated down below 105 ADM and prorated up for 316 ADM and above. Provide 1.0 FTE secretary for 105 to 630 high school ADM, prorated down below 105 ADM and prorated up for 631 ADM and above. Resourced at the highest-grade prototype using total school ADM. Provide1.0 clerical for 288 ADM prototypical elementary school. Provide 1.0 clerical for ADM prototypical middle school. Provide 2.0 clerical for 315 ADM prototypical high school (total of 4.0 secretaries for 630 students). All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	Provide 1.0 secretary for 105 to 315 middle school ADM, prorated down below 105 ADM and prorated up for 316 ADM and above. Provide 1.0 FTE secretary for 105 to 630 high school ADM, prorated down below 105 ADM and prorated up for 631 ADM and above. Resourced at the highest-grade prototype using total school ADM. Provide1.0 clerical for 288 ADM prototypical elementary school. Provide 1.0 clerical for ADM prototypical middle school. Provide 2.0 clerical for 315 ADM prototypical high school (total of 4.0 secretaries for 630 students). All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.		at 192 ADM, then prorated down to 1.0 at 96ADM and prorated by ADM below this level. Prorated up above 288 ADM at rate of 1.0 for every 144 elementary students. Provide 2.0 secretary positions for every prototypical middle school, prorated down to 1.5 at 210 ADM, then prorated down to 1.0 at 105 ADM and prorated by ADM below this level. Prorated up above 315 ADM at rate of 1 for every and 157.5 middle school students. Provide 3.0 secretary positions for all high schools reduced to two for 315 ADM prorated down to 1.5 at 210 ADM, then prorated down to 1.0 at 105 ADM and prorated by ADM below this level. Prorated up above 630 at rate of 1 for every 210 high school ADM. All FTE positions prorated up or down from prototypical level and resourced at

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
			the highest-grade prototype using total school ADM. Recalibrate This is a new EB recommendation.

Analysis and Evidence

The secretarial ratios included in the EB model generally are derived from common practices across the country. There is no research on the impact that clerical staff have on student outcomes, yet it is impossible to have a school operate without adequate clerical staff support.

Resource Use Analysis

Across Wyoming, in 2012-13 the funding model resourced a total of 693.5 secretarial and clerical positions while the districts employed 621.9 or 71.6 fewer school level secretarial and clerical staff. That year, 25 districts paid average salaries for these positions that exceeded the model while 23 paid lower average salaries. In one district, average salaries exceeded the model level of funding by $13,368 and in the district with the salaries furthest below the model level, salaries were $9,109 below the model. On a percentage basis, this ranged from a high of 143% of model salaries for clerical and secretarial staff to a low of 72% of model salaries for those positions.

DOLLAR PER STUDENT RESOURCES

This section addresses areas that are funded by dollar per student amounts, including gifted and talented, professional development, computers and other technology, instructional materials and supplies, extra duty/student activities.

15. Gifted and Talented Students[4]

A complete analysis of educational adequacy should include the gifted, talented, and able and ambitious students, most of who perform above state proficiency standards. This is important for all states whose citizens desire improved performance for students at all levels of achievement.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
$25 per ADM in 2010 inflated annually	Provide an amount equal to$29.41 per ADM	Modest difference	Precise the dollar figure during 2015 recalibration.

Analysis and Evidence

Research shows that developing the potential of gifted and talented students requires:

- Effort to discover the hidden talent of low income and/or culturally diverse students
- Curriculum materials designed specifically to meet the needs of talented learners
- Acceleration of the curriculum
- Special training in how teachers can work effectively with talented learners.

Discovering hidden talents in low-income and/or culturally diverse high ability learners. Research studies on the use of performance assessments, nonverbal measures, open-ended tasks, extended try-out and transitional periods, and inclusive definitions and policies produce increased and more equitable identification practices for high ability culturally diverse and/or low-income learners. Access to specialized services for talented learners in the elementary years is especially important for increased achievement among vulnerable students. For example, high-ability, culturally-diverse learners who participated in three or more years of specialized elementary and/or middle school programming had higher achievement at high school graduation, as well as other measures of school achievement, than a comparable group of high ability students who did not participate (Struck, 2003).

Access to curriculum. Overall, research shows that curriculum programs specifically designed for talented learners produce greater learning than regular academic programs. Increased complexity of the curricular material is a key factor (Robinson & Clinkenbeard, 1998). Large-scale curriculum projects in science and mathematics in the 1960s, such as the Biological Sciences Curriculum Study (BCSC), the Physical Science Study Committee (PSSC), and the Chemical Bond Approach (CBA), benefited academically talented learners (Gallagher, 2002).

[4] This section is based on an unpublished literature review written by Dr. Ann Robinson, Professor, University of Arkansas at Little Rock.

Further, curriculum projects in the 1990s designed to increase the achievement of talented learners in core content areas such as language arts, science, and social studies produced academic gains in persuasive writing and literary analysis (VanTassel-Baska, Johnson, Hughes & Boyce, 1996; VanTassell-Baska, Zuo, Avery & Little, 2002), scientific understanding of variables (VanTassel-Baska, Bass, Ries, Poland & Avery, 1998), and problem generation and social studies content acquisition (Gallagher & Stepien, 1996; Gallagher, Stepien & Rosenthal, 1992).

Access to acceleration. Because academically talented students learn quickly, one effective option for serving them is acceleration of the curriculum. Many educators and members of the general public believe acceleration always means skipping a grade. However, there are at least 17 different types of acceleration ranging from curriculum compacting (which reduces the amount of time students spend on material) to subject matter acceleration (going to a higher grade level for one class) to high school course options like Advanced Placement or concurrent credit (Southern, Jones & Stanley, 1993). In some cases, acceleration means *content* acceleration, which brings more complex material to the student at his or her current grade level. In other cases, acceleration means *student* acceleration, which brings the student to the material by shifting placement. Reviews of the research on different forms of acceleration have been conducted across several decades and consistently report the positive effects of acceleration on student achievement (Gallagher, 1996; Kulik & Kulik, 1984; Southern, Jones & Stanley, 1993), including Advanced Placement classes (Bleske-Rechek, Lubinski & Benbow, 2004). Multiple studies also report participant satisfaction with acceleration and benign effects on social and psychological development.

Access to trained teachers. Research and teacher reports indicate that general classroom teachers make very few, if any, modifications for academically talented learners (Archambault, et al, 1993), even though talented students have mastered 40 to 50 percent of the elementary curriculum before the school year begins. In contrast, teachers who receive appropriate training are more likely to provide classroom instruction that meets the needs of talented learners. Students report differences among teachers who have had such training, and independent observers in the classroom document the benefit of this training as well (Hansen & Feldhusen, 1994). Curriculum and instructional adaptation requires the support of a specially trained coach at the building level, which could be embedded in the instructional coaches recommended above (Reis & Purcell, 1993). Overall, learning outcomes for high ability learners are increased when they have access to programs whose staff have specialized training in working with high ability learners, which could be accomplished with the professional development resources recommended below.

Overall, research on gifted programs indicates that the effects on student achievement vary by the strategy of the intervention. Enriched classes for gifted and talented students produce effect sizes of about +0.40 and accelerated classes for gifted and talented students produce somewhat larger effectives sizes of +0.90 (Gallagher, 1996; Kulik & Kulik, 1984; Kulik & Kulik, 1992).

Practice implications. At the elementary and middle school level, our understanding of the research on best practices is to place gifted students in special classes comprised of all gifted students and accelerate their instruction because such students can learn much more in a given time period than other students. When the pull out and acceleration approach is not possible, an alternative is to have these students skip grades in order to be exposed to accelerated instruction. Research shows that neither of these practices systemically produces social adjustment problems. Many gifted students get bored and sometimes restless in classrooms that do not have accelerated instruction. Both of these strategies have little or no cost, except for scheduling and training of teachers, resources for which are provided by Professional Development (Element 19).

The primary approach to serve gifted students in high schools is to enroll them in advanced courses, such as advanced placement (AP) and International Baccalaureate (IB), to participate in dual enrollment in postsecondary institutions, or to have them take courses through distance learning mechanisms.

We confirmed our understanding of best practices for the gifted and talented with the directors of three of the Gifted and Talented research centers in the United States: Dr. Elissa Brown, Director of the Center for Gifted Education, College of William & Mary; Dr. Joseph Renzulli, The National Research Center on the Gifted and Talented at the University of Connecticut; and Dr. Ann Robinson, Director of the Center for Gifted Education at the University of Arkansas at Little Rock.

The University of Connecticut center also agreed with these conclusions and has developed a very powerful Internet-based platform, Renzulli Learning, which could provide for a wide range of programs and services for gifted and talented students. This system takes students through about a 25-30 minute detailed assessment of their interests and abilities, which produces an individual profile for the student. The student is then directed, via a search engine, to 14 different Internet data systems, including interactive web-sites and simulations that provide a wide range of opportunities to engage the student's interests. Renzulli stated that such an approach was undoubtedly the future for the very bright student and could be supported by a grant of $25 per student in a district. Field (2007) found that after 16 weeks, students given access to an internet based program, such as Renzulli Learning to read, research, investigate, and produce materials, significantly improved their overall achievement in reading comprehension, reading fluency and social studies.

Resource Use Analysis

Gifted and Talented was excluded from the CRERW analysis. WDE data show that in 2012-13, 24 districts reported a total of $7,684,766 in expenditures for Gifted and Talented Education. It is likely that other districts report Gifted and Talented Expenditures in different accounting functions and objects. It is even possible that the districts reporting Gifted and Talented expenditures in this category may have other expenditures in other functions or objects that could be coded as Gifted and Talented. School districts and Wyoming community colleges provide for students in high school to partake in dual and concurrent enrollment courses free of charge to the student.

16. Intensive Professional Development

Professional development (PD) includes a number of important components. This section describes the specific dollar resource recommendations the EB model provides for PD. In addition to the resources listed here, PD includes the instructional coaches described in Element 7 and the collaborative planning time provided by the provisions for elective or specialist teachers. Those staff positions are critical to an adequate PD program along with the resources identified in this section.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
10 days of student free time for training $100 per ADM for trainers inflated annually, to $124.46	10 days of student free time for training $100 per ADM for trainers inflated to $117.64.	Very minor difference part of LSO estimate that combines a number of areas	Precise the dollar figure during 2015 recalibration.

Analysis and Evidence

Effective teachers are the most influential factor in student learning (Rowan, Correnti & Miller, 2002; Wright, Horn & Sanders, 1997) and more systemic deployment of effective instruction is key to improving student learning and reducing achievement gaps (Odden, 2011a; Raudenbusch, 2009). All school faculties need ongoing professional development. Improving teacher effectiveness through high quality professional development is arguably one of the most important resource strategies identified.

An ongoing, comprehensive and systemic professional development strategy is the way in which all the resources recommended in this report are transformed into high quality, Tier 1 instruction that increases student learning. Further, though the key focus of professional development is for better instruction in the core subjects of mathematics, reading/language arts, writing, history and science, the professional development resources in the EB model are adequate to address the instructional needs for gifted and talented, special education, English language learning students, for embedding technology in the curriculum, and for elective teachers as well. Finally, all beginning teachers need intensive professional development, first in classroom management, organization and student discipline, and then in instruction. And the most effective way to "induct" and "mentor" new teachers is to have them working in functional collaborative teacher teams, discussed above for Element 4.

Fortunately, there is recent and substantial research on effective professional development and its costs (e.g., Crow, 2011; Odden, 2011b). Effective professional development is defined as professional development that produces change in teachers' classroom-based instructional practice that can be linked to improvements in student learning. The practices and principles that researchers and professional development organizations use to characterize "high quality" or "effective" professional development draw upon a series of empirical research studies that linked program strategies to changes in teachers' instructional practice and subsequent increases in student achievement. Combined, these studies and recent reports from Learning Forward, the national organization focused on professional development (see Crow, 2011), identified six structural features of effective professional development:

- The *form* of the activity – that is, whether the activity is organized as a study group, teacher network, mentoring collaborative, committee or curriculum development group. The above research suggests that effective professional development should be school-based, job-embedded and focused on the curriculum taught rather than a one-day workshop.
- The *duration* of the activity, including the total number of contact hours that participants are expected to spend in the activity, as well as the span of time over which the activity takes place. The above research has shown the importance of continuous, ongoing, long-term professional development that totals a substantial number of hours each year, at least 100 hours and closer to 200 hours.
- The degree to which the activity emphasizes the *collective participation* of teachers from the same school, department, or grade level. The above research suggests that effective professional development should be organized around groups of teachers from a school that over time includes the entire faculty
- The degree to which the activity has a *content focus* – that is, the degree to which the activity is focused on improving and deepening teachers' content knowledge as well as how students learn that content. The above research concludes that teachers need to know well the content they teach, need to know common student miscues or problems students typically have learning that content, and effective instructional strategies linking the two. The content focus today should emphasize content for college and career ready curriculum standards.
- The extent to which the activity offers opportunities for *active learning*, such as opportunities for teachers to become engaged in the meaningful analysis of teaching and learning for example, by scoring student work or developing, refining and implementing a standards-based curriculum unit. The above research has shown that professional development is most effective when it includes opportunities for teachers to work directly on incorporating the new techniques into their instructional practice with the help of instructional coaches (see also Joyce & Showers, 2002).
- The degree to which the activity promotes *coherence* in teachers' professional development, by aligning professional development to other key parts of the education system such as student content and performance standards, teacher evaluation, school and district goals, and the development of a professional community. The above research supports tying professional development to a comprehensive, inter-related change process focused on improving student learning.

Form, duration, and active learning together imply that effective professional development includes some initial learning (*e.g.* a two-week – 10 day – summer training institute) as well as considerable longer-term work in which teachers incorporate the new methodologies into their actual classroom practice, with guidance provided by instructional coaches. Active learning implies some degree of collaborative work and coaching during regular school hours to help the teacher incorporate new strategies in his/her normal instructional practices. It should be clear that the longer the duration, and the more the coaching, the more time is required of teachers as well as professional development trainers and coaches.

Content focus means that effective professional development focuses largely on subject matter knowledge, what is known about how students learn that subject, and the actual curriculum that is used to teach the content. Today this means a curriculum program to ensure students are college and career ready when they graduate from high school. Collective participation implies that professional development includes groups of and at some point all teachers in a school, who then work together to implement the new strategies, engage in data-based decision making (Carlson, Borman & Robinson, 2011) and build a professional community.

Coherence suggests that the professional development is more effective when the signals from the policy environment (federal, state, district, and school) reinforce rather than contradict one another or send multiple, confusing messages. Coherence also implies that professional development opportunities should be given as part of implementation of new curriculum and instructional approaches, today focusing on the Common Core curriculum or curriculum linked to college and career ready standards. Note that there is little support in this research for the development of individually oriented professional development plans; the research implies a much more systemic approach.

Each of these six structural features has cost implications. Form, duration, collective participation, and active learning require various amounts of both teacher and trainer/coach/mentor time, during the regular school day and year and, depending on the specific strategies, outside of the regular day and year as well. This time costs money. Further, all professional development strategies require some amount of administration, materials and supplies, and miscellaneous financial support for travel and fees. Both the above programmatic features and the specifics of their cost implications are helpful to comprehensively describe specific professional development programs and their related resource needs.

From this research on the features of effective professional development, the EB model includes the following for a systemic, ongoing, comprehensive professional development program:

- 10 days of student free time for training
- Funds for training at the rate of $117.64 per student

These resources are in addition to:

- Instructional coaches (Element 7)
- Collaborative work with teachers in their schools during planning and collaborative time periods (Element 4)

Resource Use Analysis

The Wyoming Funding Model allocated $10,511,704 for professional development training in 2012-13. The districts reported expenditures of $7,995,295 that year, or 76.1% of the funds they received for that purpose. Nine districts spent more than their professional development allocation, while 39 spent less, and one district did not report spending any money for professional development. During the 2015 recalibration, the legislature should consider establishing incentives for districts to sponsor more professional development, as it is key to improving instructional practice in ways that boost student achievement.

17. Instructional Materials

The need for up-to-date instructional materials is paramount. Newer materials contain more accurate information and incorporate the most contemporary pedagogical approaches. New curriculum materials are critical today as the school systems shifts to more rigorous college and career ready standards. To ensure that materials are current, twenty states have instituted adoption cycles in which they specify or recommend texts that are aligned to state learning standards (Ravitch, 2004). Up-to-date instructional materials are expensive, but vital to the learning process. Researchers estimate that up to 90 percent of classroom activities is driven by textbooks and textbook content (Ravitch, 2004). Adoption cycles with state funding attached allow districts to upgrade their texts on an ongoing basis instead of allowing these expenditures to be postponed indefinitely.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
Instructional materials: $149.23 per ADM for elementary and middle schools and $186.54 per ADM for high schools.	$335.93 per ADM for elementary and middle schools and $411.33 per ADM for high schools.	$18,104,526	Recalibrate

Analysis and Evidence

Given the emergence of college and career ready standards, and the availability of instructional materials in digital form, this Model Component should be more formally recalibrated in 2015.

Resource Use Analysis

The WDE CRERW report combined expenditures for instructional materials and technology into one category for reporting purposes. The Wyoming Funding Model generates a total of $46,868,777 in funds for the districts, which in turn spent $35,591,703.00 or $11,277,074 less than allocated. This represents 80.6% of the funds generated by the model for technology and instructional supplies. It is not possible to determine what proportion of this went for technology specific equipment and supplies and what for textbooks and other supplies. Costs for assessment are detailed in Element 18 immediately below.

18. Short Cycle/Formative Assessments

The need to progress monitor students with Individual Education Programs and for teachers to engage in collaborative work using student data requires that faculties have access to short cycle, interim assessment data.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
$37.70 per ADM and not subject to an ECA.	$37.70 per ADM and not subject to an ECA.	$0	Precise the dollar figure during 2015 recalibration.

Analysis and Evidence

Data-based decision making has become an important element in school reform over the past decade. It began with the seminal work of Black and William (1998) on how ongoing data on student performance could be used by teachers to frame and reform instructional practice, and continued with current best practice on how professional learning communities use student data to improve teaching and learning (DuFour, et al., 2010; Steiny, 2009). The goal is to have teachers use data to inform their instructional practice, identify students who need interventions and improve student performance (Boudett, City & Murnane, 2007). As a result, data based decision making has become a central element of schools that are moving the student achievement needle (Odden, 2009, 2012).

Recent research on data-based decision making has documented significant, positive impacts on student learning. For example, Marsh, McCombs and Martorell (2010) showed how data-driven decision-making in combination with instructional coaches produced improvements in teaching practice as well as student achievement. Further, a recent study of such efforts using the gold standard of research – a *randomized controlled trial* – showed that engaging in data-based decision making using interim assessment data improved student achievement in both mathematics and reading (Carlson, Borman & Robinson, 2011).

There is some confusion in terminology when referring to these new assessment data. Generally, these student performance data are different from those provided by state accountability or summative testing, such as Wyoming's end of year tests. The most generic term is "interim data," meaning assessment data collected in the interim between the annual administrations of state accountability tests, though some practitioners and writers refer to such data as "formative assessments." There are at least two kinds of such "interim" assessment data. Benchmark assessments, such as those provided by the Northwest Evaluation System called MAP (www.nwea.org), which are given 2-3 times a year, often at the beginning, middle and end of the year. They are meant to provide "benchmark" information so teachers can see at the end of the semester how students are progressing in their learning. Sometimes these benchmark assessments are given just twice, once in the fall and again in late spring, and function just as a pre- and post-test for the school year, even though some practitioners erroneously refer to tests used this way as "formative assessments." These test data cannot be used for progress monitoring in a Response to Intervention program of extra help for struggling students.

A second type of assessment data is collected during shorter time cycles within every quarter, such as monthly, and often referred to as "short cycle" or "formative" assessments. These more "micro" student outcome data are meant to be used by teachers to plan instructional strategies before a curriculum unit is taught, to track student performance for the two-to-three curriculum concepts that would normally be taught during a nine week or so instructional period, and to progress monitor students with IEPs.

Examples of "short cycle" assessments include STAR Enterprise from Renaissance Learning (www.renaissance.com), which is in an online, adaptive system that provides data in reading/literacy and mathematics for grades PreK-12. The basic package costs less than $10 a student per subject, takes students about 20-30 minutes to take the test, are now aligned to the Common Core, can be augmented with professional development activities and programs and can be given as often as the teacher wishes. Many Reading First schools as well as many schools we have studied (Odden & Archibald, 2009; Odden, 2009) use the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessments (http://dibels.uoregon.edu).

The Wireless Generation, now one of three parts of Amplify which was launched in July 2012 as an education division of News Corp, has created an assessment, similar to DIBELS, that can be used with a handheld, mobile, electronic device. The company also offers a web service that provides professional development for teachers on how to turn the results into specific instructional strategies, including video clips of how to teach certain reading skills. The cost is approximately $15 per student per year, plus approximately $200 per teacher for the device, and somewhat more for training, though the company usually uses a trainer-of-trainers approach.

Many districts have also developed their own benchmark tests in mainly core subject areas. Others use common unit or chapter tests to gauge interim student progress toward achieving standards. While these tests cannot be normed because of their localized origin, they can provide valuable information to site and district teachers and administrators to ensure students are learning and that teachers have covered the subject standards required in district pacing guides.

Though some "interim" assessments are teacher created, it often is more efficient to start with commercially available packages, most of which are administered online and provide immediate results. Short cycle assessments provide the information a teacher needs to create a micro-map for how to teach specific curriculum units. Analyses of the state tests provide a good beginning for schools to redesign their overall educational program. Benchmark assessments give feedback on each semester of instruction and are often used to determine which students need interventions or extra help. Teachers also need additional short cycle assessment and other screening data to design the details of, and daily lesson plans for, each specific curriculum unit in order to become more effective in getting all students to learn the main objectives in each curriculum unit to the level of proficiency.

When teachers have the detailed data from these interim assessments, they are able to design instructional activities that are more precisely matched to the exact learning status of the students in their own classrooms and school. In this way, their instruction can be much more efficient because they know the goals and objectives they want students to learn, and they know exactly what their students do and do not know with respect to those goals and objectives. With these data they can design instructional activities specifically to help the students in their classrooms learn the goals and objectives for the particular curriculum unit.

The costs of these powerful assessments are modest. The EB model provides $30 to $35 per student, which is more than sufficient for a school to purchase access to the system, as well as some specific technological equipment and related professional development. The Renaissance Learning STAR assessments can function as both interim and benchmark assessments, can be used to progress monitor students with IEPs, include both math and reading PreK-12, and cost less than this figure. Some districts have dropped Scantron, NWEA MAP, and Aims Web assessments and replaced them with just the single STAR enterprise system that provides all the information of the previous three, and at a lower overall cost.

Resource Use Analysis

The Wyoming Funding Model provides each district with $37.70 per ADM for assessment costs. Only 33 of the 48 districts reported expenditures in this category; it is not clear how assessment expenditures are recorded in the remaining 15 districts. Of the 33 districts reporting expenditures, only four spent more than the model allocation, while the remaining 29 spent less than the model allocates. Among the 33 districts reporting expenditures, total assessment expenditures amounted to $1,648,832, some $1,744,848 less than the $3,393,680 funded through the model.

19. Technology and Equipment

Over time, schools need to embed technology in instructional programs and school management strategies. Today, more and more states require students not only to be technologically proficient but also to take some courses online in order to graduate from high school. Further, there are many online education options, from state-run virtual schools such as those in Florida and Wisconsin, to those created by private sector companies who run many virtual charter schools, such as K12 Inc. and Connections Academy. "Blended instructional" or "the flipped classroom" models, such as Rocketship, have also emerged (Whitmire, 2014). These programs infuse technology and online teaching into regular schools, provide more 1-1-student assistance, and put the teacher into more of a coaching role (see Odden, 2012). Research also shows that these technology systems work very well for many students, and can work very effectively in schools with high concentrations of lower income and minority students (Whitmire, 2014). Moreover, they can be less costly than traditional public schools (Battaglino, Haldeman & Laurans, 2012; Odden, 2012).

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
$250 per pupil inflated annually to $266.49	Provide an amount equal to $294 per ADM.	$3,281,514	Recalibrate

Analysis and Evidence

Given the evolution of the Internet, potential of online and digital learning, the emergence of tablets, low cost computers such as Chromebooks, and other less costly computers, this Model Component should be formally recalibrated in 2015.

Resource Use Analysis

The WDE CRERW report combined expenditures for instructional materials and technology into one category for reporting purposes. The Wyoming Funding Model generates a total of $46,868,777 in funds for the districts who in turn spent $35,591,703.00 or $11,277,074 less than allocated. This represents 80.6% of the funds generated by the model for technology and instructional supplies. It is not possible to determine what proportion of this went for technology specific equipment and supplies and what for textbooks and other supplies. Costs for assessment are detailed in Element 18 immediately above. (Note that what is reported here is exactly the same as reported in the resource use analysis section of Element 17 – instructional materials.)

20. Career Technical Education Equipment/Materials

Vocational education, or its modern term, Career and Technical Education (CTE), has experienced a shift in focus in the past decade. Traditional vocational education focused on practical, applied skills needed for wood and metalworking, welding, automobile mechanics, typing and other office assistance careers, as well as courses in home economics. Today, many argue that vo-tech is more appropriately info-tech, nano-tech, biotech, and health-tech. The argument is that Career and Technical education should begin to incorporate courses that provide students with applied skills for new work positions in the growing and higher wage economy including information technologies (such as computer network management), engineering (such as computer-assisted design), a wide range of jobs in the expanding health portions of the economy and bio-technical positions – all of which can be entered directly from high school. The American College Testing Company and many policymakers have concluded that the knowledge, skills and competencies needed for college are quite similar to those needed for work in the higher-wage, growing jobs of the evolving economy, so all students need a solid academic high school program to be college and career ready when they graduate from high school.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
$9,622.70 per vocational education teacher FTE. $1,854.45 for equipment allowance; $6,841.74 for supply allowance, and $926.51 for equipment replacement.	Inflated amounts of $9,094.97 per vocational education teacher FTE. $1,752.75 for equipment allowance; $6,466.52 for supply	Marginal difference in equipment costs Wyoming also provides an extra weight of 0.29 for all	Precise the dollar figure during 2015 recalibration.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
	allowance, and $875.70 for equipment replacement.	students in career technical programs to lower those class sizes (see Element 5 above).	

Analysis and Evidence

A key issue is the cost of career and technical education programs. Many districts and states believe that new career-technical programs cost more than the regular program and even more than traditional vocational classes. However, in a review conducted for a Wisconsin school finance adequacy task force, a national expert on career-technical education (Phelps, 2006) concluded that the best of the new career-technical programs did not cost more, especially if the district and state made adequate provisions for professional development (as teachers in these new programs needed training) and computer technologies (as computer technologies were heavily used). These conclusions generally were confirmed by the cost analysis we conducted of Project Lead the Way (PLTW), one of the most highly rated and allegedly "expensive" career technical programs in the country. We presented our findings to Wyoming as part of the 2010 recalibration (Odden & Picus, 2010).

PLTW (**www.pltw.org**) is a nationally recognized exemplar for secondary CTE education. Often implemented jointly with local postsecondary education institutions and employer advisory groups, these programs usually feature project- or problem-based learning experiences, career planning and guidance services, and technical and/or academic skills assessments. Through hands-on learning, the programs are designed to develop the science, technology, engineering and mathematics (STEM) skills essential for achievement in the classroom and success in college or jobs not requiring a four-year college education. Today, PLTW is offered in more than 5,000 elementary, middle and high schools in all 50 states and enrolled over 500,000 students.

The curriculum features rigorous, in-depth learning experiences delivered by certified teachers and end-of-course assessments. High-scoring students earn college credit recognized in more than 100 affiliated postsecondary institutions. Courses focus on engineering foundations (design, principles, and digital electronics) and specializations (e.g., architectural and civil engineering, bio-technical engineering) that provide students with career and college readiness competencies in engineering and science. Students need to take math through Algebra 2 in order to handle the courses in the program, which also meets many states' requirements for science and other mathematics classes.

The major cost areas for the program are in class size, professional development and computer technologies. Most programs recommend class sizes of 25, a figure larger than provided for high school students by the Wyoming Funding Model. The professional development and most of the computer technology costs are covered through the professional development and technology components of the model. In most other states, these would be new costs but they are already embedded in the Wyoming school funding system. However, a few of the PLTW concentration areas require a one-time purchase of expensive equipment, which can be covered by the $9,623 per career-technical education teacher in the Wyoming Funding Model.

Resource Use Analysis

Analysis of vocational education teaching positions is discussed in Element 5 above. The funding model allocates a total of $2,801,658 to the districts for vocational education supplies and equipment. The districts spent 55.9% of that amount, or $1,236,738 in 2012-13. Four districts spent more than was allocated, 43 less, and one had no allocation and did not report any expenditures.

21. Extra Duty Funds/Student Activities

Elementary, middle and high schools typically provide an array of non-credit producing after-school programs, such as clubs, bands, sports, and other activities. Teachers supervising or coaching in these activities usually receive small stipends for these extra duties.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
$308.04 per ADM.	Funded at grade-band level, by school. For grades K-5, provide an amount equal to $24.23 per student. For grades 6-12, use inverse sliding scales based on student enrollment for middle (grades 6-8) and high (grades 9-12) school grades levels. Middle school funding levels range from $796.95 for 1 ADM and $205.90 per ADM for a school of 1,260 ADM. High school funding levels range from $2,054.39 for 1 ADM and $605.59 per ADM for a school of 1,260 ADM. Alternative schools receive an amount equal to $291.15 per ADM.	$5,535,663	Recalibrate

Analysis and Evidence

Research shows, particularly at the secondary level, that students engaged in student activities tend to perform better academically than students not so engaged (Feldman & Matjasko, 2005), although too much extra-curricular activity can be a detriment to academic learning (Committee on Increasing High School Students' Engagement and Motivation to Learn, 2004; Steinberg, 1996, 1997). Feldman and Matjasko (2005) found that participation in interscholastic (as compared to intramural) sports had a positive impact for both boys and girls on: grades, post secondary education aspirations, reducing drop out rates, lowering alcohol and substance abuse, and led to more years of schooling. The effect was particularly strong for boys participating in interscholastic football and basketball. One reason for these impacts is that participation in interscholastic athletics placed students in new social groups that that tended to have higher scholastic aspirations and those aspirations "rubbed off" on everyone. But the effects differed by race and gender, and were not as strong for African Americans.

During the past several years, the EB model has allocated between $200 and $300 per pupil for student activities, including inter-mural sports. These figures are in line with average amounts spent on such activities in many states. However, Wyoming presents a special case because of its many small districts and schools, which face much higher costs in mounting interscholastic sports. Further, as the resource use analysis below shows, districts spend more on student activities than is currently provided in the Legislature's funding model. Therefore, this model component should be subject to a more formal recalibration in 2015.

Resource Use Analysis

In 2012-13 the funding model allocated a total of $37,730,1331 to districts for student activities. Ten districts spent less than their model funding level and the other 38 spent more than the model provided. Overall, districts spent 121.0% of the model allocation or a total of $6,549,687 more. The CRERW report shows that over time the allocation for student activities has declined somewhat since 2009-10 (likely a function of school enrollments as overall ADM increases), but that expenditures for student activities have continued to grow over that time frame.

CENTRAL OFFICE FUNCTIONS

In addition to school-based resources, education systems also need resources for district level expenditures including operations and maintenance, the central office and transportation. These are outlined below.

22. Operations and Maintenance

Computation of operations and maintenance costs is complicated by the lack of a strong or consistent research base. Some models allocate a percentage of current expenditures to operations and maintenance. The EB model uses formulas to compute the number of personnel needed *at the school level* for custodial, maintenance and grounds work and Wyoming uses those formulas to estimate staffing for operations and maintenance costs

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
Separate computations for custodians, maintenance workers and groundskeepers as outlined in the analysis and evidence section below	Same as EB recommendation	$0	Recalibrate

Analysis and Evidence

Drawing on professional standards in the field as well as research, we have recently conducted analyses of the cost basis for maintenance and operations (e.g., Picus & Odden, 2010; Picus & Seder, 2010). The discussion below summarizes our research on operations and maintenance, identifying the needs for custodians (school level), maintenance staff (district level) and groundskeepers (school and district level), as well as the costs of materials and supplies to support these activities.

<u>*Custodians*</u>*:* Custodians are responsible for the daily cleaning of classrooms and hallways as well as for routine furniture set ups and takedowns. In addition, custodians often manage routine and simple repairs like minor faucet leaks, and are expected to clean cafeterias/multipurpose rooms, lockers and showers. Custodial workers' duties are time-sensitive, are structured and varied. Zureich (1998) estimates the time devoted to various custodial duties:

- Daily duties (sweep or vacuum classroom floors; empty trash cans and pencil sharpeners in each classroom; clean one sink with faucet; and, security of room), which take approximately 12 minutes per classroom.
- Weekly duties (dust reachable surfaces; dust chalk trays and clean doors; clean student desk tops; clean sink counters and spots on floors; and, dust chalk/white boards and trays), each of which adds 5 minutes a day per classroom.

- In addition to these services, non-cleaning services (approximately 145 minutes per day) provided by custodians include: opening school (checking for vandalism, safety and maintenance concerns), playground and field inspection, miscellaneous duties (teacher/site-manager requests, activity set-ups, repairing furniture and equipment, ordering and delivering supplies), and putting up the flag and PE equipment.

A formula that takes into consideration these cleaning and non-cleaning duties has been developed and updated by Nelli (2006). The formula takes into account teachers, students, classrooms and Gross Square Feet (GSF) in the school. The formula is:

- 1 Custodian for every 13 teachers, plus
- 1 Custodian for every 325 students, plus
- 1 Custodian for every 13 classrooms, plus
- 1 Custodian for every 18,000 Gross Square Feet (GSF), and
- The total divided by 4.

The formula calculates the number of custodians needed at prototypical schools. The advantage of using all four factors is that it accommodates growth or decline in enrollment and continues to provide the school with adequate coverage for custodial services over time.

<u>*Maintenance Workers*</u>: Maintenance workers function at the district level, rather than at individual schools. Core tasks provided by maintenance workers include preventative maintenance, routine maintenance and emergency response activities. Individual maintenance worker accomplishment associated with core tasks are: (a) HVAC systems, HVAC equipment, and kitchen equipment; (b) Electrical systems, electrical equipment; (c) Plumbing systems, plumbing equipment; and, (d) Structural work, carpentry and general maintenance/repairs of buildings and equipment (Zureich, 1998).

Zureich (1998) recommends a formula for maintenance worker FTEs incorporated into the funding model for instructional facilities as follows:

[(# of Buildings in District) x 1.1 + (GSF/60,000 SqFt) x
1.2 + (enrollment/1,000) x 1.3
+ General Fund Revenue/5,000,000) x 1.2] / 4
= Total number of Maintenance Workers needed.

Maintenance and Custodial supplies are estimated at $0.70 per gross square foot. The school gross square feet are 606,381 plus an estimated 10 percent more for the central office, bringing total district gross square footage to 667,019 and the cost of materials and supplies to $466,913 or $116.73 per student.

The Florida Department of Education has released a new set of facilities guidelines that discuss custodial and maintenance personnel and are based largely on the Zureich materials that guided development of the Wyoming model in 2005. The guidelines are similar to, but not exactly the same as those developed for Wyoming. A recalibration of the maintenance standards would lead to consideration of these (and potentially other standards identified through sources such as

ASBO) standards. In addition recalibration should consider the portion of the formula that relies on district general fund revenues divided by $5,000,000 to see if either of those numbers need to be revised, or if that part of the computation is required any more.

Grounds Maintenance: The typical goals of a school grounds maintenance program are generally to provide safe, attractive, and economical grounds maintenance (Mutter & Randolph, 1987). This, too, is a district level function. We have estimated that an elementary school needs 62 days per years of groundskeeper support, a middle school 140 days and a high school 388 days per year. One of the issues that should be addressed in the recalibration is how to address the large open acreage owned by a small number of districts that has a tendency in the current model to generate a large number of groundskeeper positions. This acreage typically does not require a great deal of maintenance suggesting recalibration could more accurately estimate the number of groundskeepers needed if this were taken into consideration.

Utilities: It is necessary to add the per student costs of utilities to these totals. It is unlikely that a district has much control over these costs in the short run and thus each district can best estimate future costs using their current expenditures for utilities and insurance as a base. The Legislature's funding model provides resources for utilities based on actual expenditures in 2009 adjusted by an ECA and increased for new square footage as it is built up in school districts.

Resource Use Analysis

This section first considers operations and maintenance expenditures and then provides an analysis of utility expenditures by the state's school districts. The discussion of operations and maintenance includes both expenditures for salaries and for non-staff resources.

The CRERW combines district expenditures for operations and maintenance and operations staff with expenditures for operations and maintenance supplies and equipment because it was hard to separate the two in district reports, and because in many cases districts contract for some of these services so staff and spending comparisons across districts are impossible.

For 2012-13, the Wyoming Funding Model allocated $94,298,030 to the state's school districts for maintenance and operations. Districts overall spent 97.6% of that amount or $92,046,498. Fourteen districts spent more than the model allocation, with the largest overspending amounting to 130.4% of the model allocation. The remaining 34 districts spent less than the model allocation, with the lowest ratio of spending to model allocation being 57.5%.

The model assumes an average salary of $32,810 for maintenance and operations personnel, while districts paid operations and maintenance personnel an average salary of $35,211 in 2012-13, some 7.3% or $2,402 above the model funded average. That year, districts employed 1,298.8 operations and maintenance personnel, 208.8 fewer than the 1,597.6 funded through the model.

Utilities are funded on the basis of actual utility expenditures in a base year adjusted by an inflation factor, recently one focused specifically on the cost of utilities. For 2012-13, total allocations for utilities were $35,11,860. Districts spent $1,024,282 more than that allocation or 103.0% of the model resources. Thirty districts spent more than the model, with one district spending 128.5% of its utility allocation, while 18 districts spent less then the model, with one spending 76.5% of its allocation.

23. Central Office Staffing/Non-Personnel Resources

All districts require central office staff to meet the overall management needs of the educational programs. Determining an adequate staffing level for very small districts is challenging, and in the past, the Wyoming Model has been relatively generous in the number of staff it provides. In other states, we have developed evidence based staffing models using a prototypical district of approximately 3,900 students. In most instances, when prorated down for smaller districts fewer staff result than are currently allocated through the Wyoming Funding Model.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
Less than 500 ADM – 3 administrative and 3 classified position Between 501 and 1,000 ADM – 4 administrative and 4 classified positions Beyond 1,000 ADM, provide 1 additional administrator position for every 833 ADM and provide 1 additional classified position for every 500 ADM.	Less than 500 ADM – 3 administrative and 3 classified position Between 501 and 1,000 ADM – 4 administrative and 4 classified positions Beyond 1,000 ADM, provide 1 additional administrator position for every 625 ADM and provide 1 additional classified position for every 417 ADM.	$3,834,851	A per pupil amount calculated from a 3,900-student prototypical school district. This is prorated to districts with 1,000 students. From 1000 to 400 students funding should remain at the level of funding for the central office of a 1,000 student district. This would generate approximately 2 administrative and 2.5 secretarial positions. From 400 to 200 students, the positions should be prorated down to1 professional and 1 secretarial position, and remain at that level for smaller districts. Recalibrate
Provide an amount equal to $373.38 per ADM for non-personnel resources	Provide an amount equal to $352.91 per ADM for non-personnel resources	Small difference combined with other estimates in LSO analysis	Precise dollar figures during 2015 recalibration

Analysis and Evidence

We have identified resources for central office staff in our EB reports for other states. The most recent states in which we have comparable data are Texas, North Dakota, Kentucky and Maine. Our approach has remained relatively stable, estimating the number of central office staff required to lead and manage a prototypical district of 3,900 students. Wyoming's model would generate slightly more central office staff in a 3,900-student district than are generated through the current EB model. This is shown in the table below comparing our current model to a Wyoming school district with 3,900 students. However, as we prorate our staffing positions down to smaller school districts using a dollars per pupil figure, it is unlikely that the allocations of funds we estimate as adequate would be enough to hire the number of central office staff in the Wyoming Funding Model. This is particularly true in the smallest Wyoming districts and in Wyoming districts with just over 500 ADM. Even though current spending exceeds the Wyoming Funding Model allocations, which in smaller districts is much higher than the EB model, we recommend review if not recalibration of this element of the model, for both personnel and non-personnel resources.

Comparison of EB Central Office Staffing with Current Wyoming Policy for a District with 3,900 students

	FTE			
	EB Model		Wyoming Funding Model	
Office and Position	Admin.	Classified	Admin.	Classified
Superintendent's Office				
Superintendent	1			
Secretary		1		
Business Office				
Business Manager	1			
Director of Human Resources	1			
Accounting Clerk		1		
Accounts Payable		1		
Secretary		1		
Curriculum and Support				
Assistant Supt. for Instruction	1			
Director of Pupil Services	1			
Dir. of Assessment and Evaluation	1			
Secretary		3		
Technology				
Director of Technology	1			
Computer Technician		1		
Secretary		1		
Operations and Maintenance				
Director of O&M	1			
Secretary		1		
Wyoming Staffing (3,900 Students)	***8***	***10***	***8.64***	***10.95***

Resource Use Analysis

In 2012-13, the Wyoming Funding Model generated 277.2 central office administrative positions, while districts employed 40.8 more central office administrators for a total of 317.9. Twenty-nine districts employed more central office administrators than funded through the model, while the remaining 17 employed fewer central office administrators.

In addition, the districts employed 353.8 district level secretarial/clerical staff, some 43.6 more than the 314.8 generated through the model. There were two districts that hired the number of such staff generated through the model, while 22 employed more and 24 fewer secretarial/clerical positions at the district level.

The table below shows the difference between the model salary and the average actual salary for central office staff in 2012-13.

Comparison of District Average Salaries with Funding Model Average Salaries

Position	District Average Salary ($)	Funding Model Average Salary ($)	Difference ($)	Percent Difference (%)
Superintendent	132,989	106,893	26,097	24.4
Asst. Supt.	123,724	85,514	38,210	44.7
Business Manager	89,304	72,079	17,225	23.9
Secretary/Clerical	32,623	30,742	1,881	6.1

Source: CRERW

24. Transportation

Wyoming provides 100% reimbursement of approved (to and from school and approved activities) transportation costs and we do not have any recommendation to change that.

25. Food Services

Both the EB model and the Wyoming legislature assume this is a self-supporting function and thus no additional resources are provided.

RESOURCES FOR STRUGGLING STUDENTS

The core staffing section of this document contains positions for supporting teachers and students beyond the regular classroom core teacher. Those positions include elective or specialist teachers, tutors and pupil support personnel. However in many instances, *additional* support for struggling students are needed. The programs described in this section extend the learning time for struggling students in focused ways. The key concept is to implement the maxim of standards-based education reform: keep standards high for all students but vary the instructional time so all students can achieve to proficiency levels. The EB elements for extra help are also embedded in the "response to intervention" schema described at the beginning of this chapter.

It is important to note that we use two specific counts of pupils. This is currently the practice in Wyoming as well.

1. For programs that use an "at risk" count, the EB model includes the unduplicated count of students eligible for free and reduced price lunch as well as all ELL students who are not free and reduced price lunch eligible. Wyoming's at-risk pupil count also includes mobile students in grades 6-12 who are neither ELL or free and reduced price lunch. We have followed the Wyoming practice of using an unduplicated at-risk student count to ensure that all ELL students and in Wyoming all mobile students, regardless of poverty status, are eligible for the extra help strategies that most if not all ELL and mobile students need as they work to learn both content and a new language – English.

2. For the ELL program, we use the count of all ELL students regardless of free and reduced price lunch or mobility status.

The EB model provides substantial additional resources for students based on the at-risk student counts – tutoring, extended day, summer school, and pupil support. These resources for students struggling to achieve to academic standards should be viewed in concert with resources for students with identified disabilities. Districts sometimes over identify students for special education services as the "only" way to trigger more resources for some struggling students. The EB goal in expanding resources for struggling students triggered by at-risk counts is to provide adequate resources for all struggling students, with or without a diagnosed disability, and to reduce over identification in special education.

This section includes discussion of seven categories of services: tutoring, additional pupil support, extended day, summer school, programs for ELL students, Alternative Schools, and special education.

26. Tutors

The first strategy to help struggling students is to provide additional support for struggling students as described in Element 8 above. In addition to the one core tutor position provided to every prototypical school discussed above for Element 8, the EB Model provides additional tutor position at the rate of one for every 125 at-risk students.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
1 tutor position for every 100 at-risk students, with a minimum of one tutor position in each prototypical school	1 tutor position for every 100 at-risk students, with a minimum of one tutor position in each prototypical school	$0	One tutor position for every 125 at risk students (in addition to the one tutor position in each prototypical school) These positions are provided additional days for professional development (Element 16) and substitute days (Element 9) discussed above. Recalibrate This is a revised EB recommendation

Analysis and Evidence

Refer to Element 8 for an explanation of analysis and evidence surrounding the use of tutors.

Resource Use Analysis

Wyoming school districts do not employ tutors in nearly the numbers generated through the model. There are 235.7 tutors across the state. This is only 76.6% of the 369.1 tutors allocated to districts through the funding model.

Two of the districts employ more tutors than allocated in the model, while 45 employ fewer tutors and one district is allocated zero tutors and does not employ any.

The count of tutors is confounded somewhat by the fact that districts also report a position called "teachers not of record" and some districts may be reporting some tutors in that category. A total of 76.6 teachers are reported in this category state-wide, and if it were assumed that all of them were serving in the role of tutor (an unlikely occurrence), then six more districts (for a total of 8) would employ more tutors than allocated under the model, and 39 would employ fewer tutors. Even then, the model would generate 56.8 more tutors statewide than are employed by the districts.

This analysis shows that district practices with respect to tutors is not aligned with the Legislatures funding model, i.e., districts use fewer tutors or Tier 2 interventionists than the model provides. Since extra help for struggling students, is critical to educate all students to proficient or higher performance levels, the resources for such extra help should be fully utilized. During the 2015 recalibration, the legislature should consider incentives for districts to provide struggling students extra help. Holding performance standards constant and varying instructional time is a key strategy for ensuring all students are able to meet higher standards.

27. Pupil Support

Core pupil support positions for guidance counselors and nurses are discussed above in core resources as Element 10. At-risk students, however, generally have more non-academic needs that should be addressed by additional pupil support staff, which include additional guidance counselors, as well as social workers, family liaison staff, and psychologists. Thus, in addition to the core guidance counselor and nurse positions provided to every prototypical school discussed above for Element 10, the EB Model provides additional pupil support positions at the rate of one for every 125 at-risk students.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
1 pupil support position for every 100 at-risk students, with a minimum of 1 position for each prototypical elementary, middle and high school, resourced at the highest-grade prototype using the total school ADM.	1 pupil support position for every 100 at-risk students, with a minimum of 1 position for each prototypical elementary, middle and high school, resourced at the highest-grade prototype using the total school ADM.	$0	One pupil support position for every 125 at-risk students These positions are provided additional days for professional development (Element 16) discussed above. Recalibrate This is a revised EB recommendation

Analysis and Evidence

At-risk students tend to have more non-academic issues for schools to address. This usually requires interactions with families and parents as well as perhaps more guidance counseling in school. The EB model addresses this by providing more staffing resources to meet these needs. Although there are many ways schools can provide outreach to parents, or involve parents in school activities – from fund raisers to governance – research shows that school sponsored programs that have an impact on achievement address what parents can do at home to help their children learn. For example, if the education system has clear content and performance standards, such as the new college and career ready standards, programs that help parents and students understand both what needs to be learned and what constitutes acceptable standards for academic performance have been found to improve student outcomes. Parent outreach that explicitly and directly addresses what parents can do to help their children be successful in school, and to understand the standards of performance that the school expects, are the types of school-sponsored parent activities that produce discernible impacts on students academic learning (Steinberg, 1997).

At the secondary level, the goal of parent outreach programs is to have parents learn about what they should expect of their children in terms of academic performance. If a district or a state requires a minimum number of courses for graduation, such as Wyoming's high school graduation and Hathaway scholarship requirements, those requirements should be made clear. Any differences between the two also should be addressed. If either average scores on end-of-course examinations or a cut-score on a comprehensive high school test are required for graduation, they too should be discussed. Secondary schools need to help parents understand how to more effectively assist their children in identifying an academic pathway through middle and high school, understand standards for acceptable performance, and be aware of the course work necessary for college entrance. This is particularly important for parents of students in the middle or lower end of the achievement range, as often these students know very little of the requirements for transition from high school to post-secondary education (Kirst & Venezia, 2004).

At the elementary level, the focus for parent outreach and involvement programs should concentrate on what parents can do at home to help their children learn academic work for school. Too often parent programs focus on fund raising through parent-teacher organizations, involvement in decision making through school site councils, or other non-academically focused activities at the school site. Although these school-sponsored parent activities might impact other goals – such as making parents feel more comfortable being at school or involving parents more in some school policies – they have little effect on student academic achievement. Parent actions that impact learning would include: 1) reading to them at young ages, 2) discussing stories and their meanings, 3) engaging in open ended conversations, 4) setting aside a place where homework can be done, and 5) ensuring that their child completes homework assignments.

The resources in the EB and current Wyoming Funding Model are adequate to create and deploy the ambitious and comprehensive parent involvement and outreach programs that are part of two comprehensive school designs: Success for All and the Comer School Development Program. The Success for All Program includes a family outreach coordinator, a nurse, social worker, guidance counselor and education diagnostician for a school of about 500 students. This group functions as a parent outreach team for the school, serves as case managers for students who need non-academic and social services, and usually includes a clothing strategy to ensure that all students, especially in cold climates, have sufficient and adequate clothes, and coats, to attend school.

The Comer School Development Program was created on the premise of connecting schools more to their communities. Its Parent-School team has a somewhat different composition and is focused on training parents to raise expectations for their children's learning, to work with social service agencies and to work with the school's faculty to raise their expectations for what students can learn. Sometimes the team co-locates on school site premises to provide a host of social services

A program called Communities in Schools, which now operates in 26 states and the District of Columbia and can be resourced by the resources provided by this Model Component, has been successful in raising school attendance rates as students need to attend school in order to learn. The program adds a caseworker, often trained in social work, to a school's pupil support team to help match social services provided by non-educational agencies to students who need them.

Resource Use Analysis

Allocation of pupil support personnel in relation to model allocations is described above in Element 10.

28. Extended-day programs

At both elementary and secondary school levels, some struggling students are likely to benefit from after-school or extended-day programs, even if they receive Tutoring/Tier 2 interventions during the regular school day. Extended day programs are an environment for children and adolescents to spend time after the school day ends during the regular school year.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
1.0 teacher position for every 30 at-risk students or 3.33 FTE per 100 such students. Position paid at the rate of 25 percent of annual salary—enough to pay a teacher for a 2-hour extended-day program, 5 days per week. This formula equates to 1 teacher position for every 120 at-risk students.	For both extended day and summer, funding provided outside of block grant and in form of a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students for both summer school and extended day programs. A minimum 0.50 FTE is provided for school districts that do not generate that amount based upon the district's at-risk count.	-$8,979,455 including both extended day and summer school	No change from 2010 recommendation. Recalibrate

Analysis and Evidence

In a review of research, Vandell, Pierce and Dadisman (2005) found that well designed and administered after-school programs yield numerous improvements in academic and behavioral outcomes (see also Fashola, 1998; Posner & Vandell, 1994). On the other hand, the evaluation of the 21st Century Community Learning Centers (CCLC) Program (James-Burdumy et al., 2005), though hotly debated, indicated that for elementary students, extended day programs did not appear to produce measurable academic improvement. Critics of this study (Vandell, Pierce & Dadisman, 2005) argued that the control groups had higher pre-existing achievement, which reduced the potential for finding program impact. They also argued that the small impacts that were identified had more to do with lack of full program implementation during the initial years than with the strength of the program.

Overall, studies have documented positive effects of extended day programs on the academic performance of students in select after-school programs (e.g., Takoata & Vandell, 2013: Vandell, 2014). However, the evidence is mixed both because of research methods (few randomized trials), poor program quality and imperfect implementation of the programs studied. Researchers have identified several structural and institutional supports necessary to make after-school programs effective:

- Staff qualifications and support (staff training in child or adolescent development, after-school programming, elementary or secondary education, and content areas offered in the program, staff expertise; staff stability/turnover; compensation; institutional supports)
- Program/group size and configuration (enrollment size, ages served, group size, age groupings and child staff ratio) and a program culture of mastery
- Consistent participation in a structured program
- Financial resources and budget (dedicated space and facilities that support skill development and mastery, equipment and materials to promote skill development and mastery; curricular resources in relevant content areas; location that is accessible to youth and families
- Program partnerships and connections (with schools to connect administrators, teachers and programs; with larger networks of programs, with parents and community)
- Program sustainability strategies (institutional partners, networks, linkages; community linkages that support enhanced services; long term alliances to ensure long term funding).

The resources recommended in the EB model could be used to provide struggling students in all elementary grades and in secondary schools with additional help during the school year but before or after the normal school day. Because not all at-risk students need or will attend an after school program, the EB model assumes 50 percent of the eligible at-risk students will attend the program – a need and participation figure identified by Kleiner, Nolin and Chapman (2004). As a result providing resources at a rate of 1 FTE teacher to 30 at-risk students will result in class sizes of approximately 15 in extended day programs.

The state should monitor over time the degree to which the estimated 50 percent figure accurately estimates the numbers of students needing extended-day programs. We also encourage Wyoming to require districts to track the students participating in the programs, their pre- and post-program test scores, and the specific nature of the after school program provided, to develop a knowledge base about which after-school program structures have the most impact on student learning. We recognize that how these extended day services are provided will vary across Wyoming's school districts, and that any monitoring of the impacts of these resources should focus more on impacts on student performance than the strategy for providing the services. We also found that most of the schools we studied in other states that improved student performance had various combinations of before and after school extra help programs.

Resource Use Analysis

The CRERW does not report expenditures or position counts for extended day programs, so it is not known how district expenditures compare to current funding

29. Summer School

Many students need extra instructional time to achieve the state's high proficiency standards. Thus, summer school programs should be part of the set of programs available to provide struggling students the additional time and help they need to achieve to standards and earn academic promotion from grade to grade (Borman, 2001). Providing additional time to help all students master the same content is an initiative that is grounded in research (National Education Commission on Time and Learning, 1994). It should be noted that summer school services are provided outside of the regular school year.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
1.0 teacher position for every 30 at-risk students or 3.33 FTE per 100 such students. Position paid at the rate of 25 percent of annual salary—enough to pay a teacher for a six to eight week 4 hour per day summer school program and include adequate time for planning and grading This formula equates to 1 teacher position for every 120 at-risk students.	For both extended day and summer, funding provided outside of block grant and in form of a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students for both summer school and extended day programs. A minimum 0.50 FTE provided for school districts that do not generate that amount based upon the district's at-risk count.	-$8,979,455 included both extended day and summer school	No change from 2010 recommendation. Recalibrate

Analysis and Evidence

Research dating back to 1906 shows that students, *on average*, lose a little more than a month's worth of skill or knowledge over the summer break (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). Summer breaks have a larger deleterious impact on poor children's reading and mathematics achievement. This loss can reach as much as one-third of the learning during a regular nine-month school year (Cooper et al., 1996). A longitudinal study by Alexander and Entwisle (1996) showed that these income-based summer learning differences *accumulate* over the elementary school years, such that poor children's achievement scores – without summer school – fall further and further behind the scores of middle class students as they progress through school grade by grade. As a result of this research, there is emerging consensus that what happens (or does not happen) during the summer can significantly impact the achievement of students from low-income and at-risk backgrounds, and help reduce (or increase) the poor and minority achievement gaps in the United States.

However, evidence on the effectiveness of summer programs in attaining either of these goals is mixed. Although past research linking student achievement to summer programs shows some promise, several studies suffer from methodological shortcomings and the low quality of the summer school programs themselves (Borman & Boulay, 2004).

A meta-analysis of 93 summer school programs (Cooper, Charlton, Valentine, & Muhlenbruck, 2000) found that the average student in summer programs outperformed about 56% to 60% of similar students not receiving the programs. However, the certainty of these conclusions is compromised because only a small number of studies (e.g., Borman, Rachuba, Hewes, Boulay & Kaplan, 2001) used random assignment, and program quality varied substantially. More recent *randomized controlled trial* research of summer school reached more positive conclusions about how such programs can positively impact student learning (Borman & Dowling, 2006; Borman, Goetz & Dowling, 2009). Indeed, Roberts (2000) found an effect size of 0.42 in reading achievement for a *randomized sample* of 325 students who participated in the Voyager summer school program.

Researchers (see also McCombs, et al., 2011) note several program components related to improved achievement effects for summer program attendees, including:

- Early intervention during elementary school
- A full 6-8 week summer program
- A clear focus on mathematics and reading achievement, or failed courses for high school students
- Small-group or individualized instruction
- Parent involvement and participation
- Careful scrutiny for treatment fidelity, including monitoring to ensure good instruction in reading and mathematics is being delivered, and
- Monitoring student attendance.

Summer programs that include these elements hold promise for improving the achievement of at-risk students and closing the achievement gap. Indeed, the most recent review of the effects of summer school programs reached this same conclusion (Kim & Quinn, 2013). Their meta-analysis of 41 school- and home-based summer school programs found that K-8 students who attended summer school programs with teacher directed literacy lessons showed significant improvements in multiple areas including reading comprehension. Moreover, the effects were much larger for students from low-income backgrounds.

In sum, research generally suggests that summer school is needed and can be effective for at-risk students. Studies suggest that the effects of summer school are largest for elementary students when the programs emphasize reading and mathematics, and for high school students when programs focus on courses students failed during the school year. The more modest effects frequently found in middle school programs can be partially explained by the emphasis in many middle school summer school programs on adolescent development and self-efficacy, rather than academics.

Because summer school can produce powerful impacts, the EB model provides resources for summer school for classes of 15 students, for 50 percent of all at-risk students in all grades K-12, an estimate of the number of students still struggling to meet academic requirements (Capizzano, Adelman & Stagner, 2002). The model provides resources for a program of eight weeks in length, class sizes of 15 students, and a six-hour day, which allows for four hours of instruction in core subjects. A six-hour day would also allow for two hours of non-academic activities. The formula would be one FTE position for every 30 at-risk students or 3.33 per 100 such students. Because not all at-risk students will need or will attend a summer school program, the EB model assumes 50 percent of the eligible at-risk students will attend the program – a need and participation figure identified by Kleiner, Nolin and Chapman (2004). As a result, providing resources at a rate of 1 FTE teacher to 30 at-risk students produces class sizes of approximately 15 in summer school programs. Although a summer school term of 6-8 weeks will have fewer hours than five day a week extended day programs, the EB resources summer school programs at the same rate as extended day programs to allow for teacher planning time for the summer school program – something that is less needed in extended day programs. Simplified, the EB summer school formula equates to 1 teacher position for every 120 at-risk students.

Resource Use Analysis

The CRERW does not report expenditures or position counts for summer school programs. The WDE reports that in 2012-13, 47 of the 48 districts received and spent funds for summer school. Overall revenues amounted to $12,532,594, and expenditures were $3,787 less at $12,536,381. There was more variation among the individual districts: 21 reported spending less than they received in revenue, while 24 reported spending more than their summer school revenue and two reported spending exactly what they received for summer school. One district spent $190,633 less than it received and another spent $200,062 more than it received for summer school.

30. English Language Learner (ELL) Students

Research, best practices and experience show that English language learners (ELL) need assistance to learn English, in addition to instruction in the regular content classes. This can include some combination of small classes, English as a second language classes, professional development for teachers to help them teach “sheltered English classes, and “reception” centers for districts with large numbers of ELL students who arrive as new immigrants to the country and the school throughout the year.

ELL is a separate program from the at-risk programs described above in the sections on tutors, extra pupil support, extended day and summer school. Funding is provided for *all* ELL students for these additional services regardless of free and reduced price lunch status.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
1.0 teacher position for every 100 identified ELL students.	1.0 teacher position for every 100 identified ELL students.	$0	No change from 2010 recommendation. No need for a formal recalibration.

Analysis and Evidence

Good ELL programs work, whether the approach is structured English immersion (Clark, 2009) or initial instruction in the native language, often called bilingual education. However, bilingual education is difficult to provide in most schools because students come from so many different language backgrounds. Nevertheless, bilingual programs have been studied intensively. A best-evidence synthesis of 17 studies of bilingual education (Slavin & Cheung, 2005) found that ELL students in bilingual programs outperformed their non-bilingual program peers. Using studies focused primarily on reading achievement, the authors found an effect size of +0.45 for ELL students. A more recent *randomized controlled trial* also produced strong positive effects for bilingual education programs (Slavin, et al., 2011), *but* concluded that the language of instruction is less important than *the approaches taken to teach reading*.

Addressing that important issue in *The Elementary School Journal*, Gerstein (2006) concludes that ELL students can be taught to read in English if, as shown for monolingual students, the instruction covers phonemic awareness, decoding, fluency, vocabulary and reading comprehension. Gersten's studies also showed that ELL students benefit from instructional interventions initially designed for monolingual English speaking students, the resources for which are included above in the four at-risk student triggered programs: tutoring, extended day, summer school and additional pupil support.

Beyond the provision of additional teachers to provide English as a second language instruction to students, however, research shows that ELL students need a solid and rigorous core curriculum as the basis from which to provide any extra services (Gandara & Rumberger, 2008; Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003). This research suggests that ELL students need:

- Effective teachers – a core goal of all the staffing in this report
- Adequate instructional materials (Element 17) and good school conditions
- Good assessments of ELL students so teachers know in detail their English language reading and other academic skills (Element 18)

- Less segregation of ELL students
- Rigorous and effective curriculum and courses for all ELL students, including college and career ready, and affirmative counseling of such students to take those courses
- Professional development for all teachers, focusing on sheltered English teaching skills, (Element 16)

Hakuta (2011) supports these conclusions and also notes that English language learning takes time (one reason the EB model includes the above resources for every grade level) and that "academic language" is critical to learning the new Common Core Standards. The new standards require more explicit and coherent ELL instructional strategies and extra help services if these are to be effective at ensuring that ELL students learn the subject matter, English generally, and academic English specifically – learn how to read content texts in English. Most also would agree that if this instruction requires smaller regular classes, those are already provided by the Wyoming Funding Model.

However, additional teaching staff are needed to provide English as a Second Language (ESL) instruction during the regular school day, such as having ELL students take ESL in lieu of an elective course. Although the potential to eliminate some elective classes exists if there are large numbers of ELL students who need to be pulled out of individual classrooms, it is generally agreed that to fully staff a strong ESL program each 100 ELL students should trigger one additional FTE teaching position. This makes it possible to provide additional instructional opportunities for ELL students to provide an additional dose of English instruction. The goal of this programming is to reinforce ELL student learning of academic content *and* English so at some point the students can continue their schooling in English only.

Research shows that it is the Limited English proficient, or English language learners (ELL), from lower income and generally less educated backgrounds who struggle most in school and need extra help to learn both academics and English. The EB and the Wyoming Funding Model address this need by making sure that the ESL resources triggered by just ELL pupil counts are *in addition* to other Tier 2 intervention resources including tutoring, additional pupil support, extended day and summer school resources as well as the pupil support staff (Elements 26-29),

For example, a prototypical school with 125 at-risk students and no ELL students would receive 1.0 core teacher and pupil support staff, and in addition, approximately 1.0 tutor position, 1.0 extended day, 1.0 summer school and 1.0 additional pupil support resources. But if the 125 at-risk children were all ELL students, the school would receive an *additional* 1.25 teacher positions primarily to provide ESL instruction.

Given these realities, it is more appropriate to view the EB and Wyoming approach to extra resources for ELL students as including both resources for students from at-risk backgrounds (unduplicated free and reduced price lunch, ELL and in Wyoming, mobile student counts) and ESL specific resources (Jimenez-Castellanos & Topper, 2012). That is why the EB model today uses the Wyoming approach and augments the at-risk student count to include the "unduplicated" count of students who are either free and reduced price lunch eligible or ELL (which has long been the Wyoming practice). Wyoming also includes mobile students in its count of at risk students. This ensures that all ELL students trigger the extra resources for the Tier 2 interventions as well as the resources for ESL instruction.

Resource Use Analysis

The CRERW report does not indicate how districts use ELL funds, but does note that the ELL population in Wyoming has grown to three percent of student enrollment.

31. Alternative Schools

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
No separate formula; assumes all alternative schools have 49 or fewer students and thus qualify for the small school formula of 1 AP plus 1 teacher position for every 7 students.	Provide funding for all staff at a ratio of 1 assistant principal and 1 teacher position for every 7 students.	-$88,082	No change from 2010 recommendation. Recalibrate

Analysis and Evidence

A small number of students have difficulty learning in the traditional school environment. The ALE students this report addresses are those that also have some combination of significant behavioral, social and emotional issues, often also including alcohol or drug abuse. Such students often do much better in *small* “alternative learning environments.” However, we note that this rationale for ALE does not consider alternative schools for students who simply prefer a different approach to learning academics, such as project-based learning, or more applied learning strategies that can be deployed in new career technical programs such as computer assisted engineering, etc. The EB concept of Alternative Schools, which we believe is also the state’s concept, is for “troubled” youth who need counseling and therapy embedded in the school’s instructional program.

The Institute for Education Sciences at the U.S. Department of Education published statistics on Alternative Schools and Programs for the 2007-08 school year (Carver & Lewis, 2010). That study identified 558,300 students in 10,300 district administered alternative education schools and programs across the United States. Although the report did not provide data on the size of these schools or on staffing ratios, the data above suggest an average alternative school size of 54 students. Most of the programs served students in grades 9-12. The main reasons students were enrolled in alternative programs – all of which meet our initial definition of severe emotional and/or behavioral problems – included:

- Possession or use of firearms or other weapons
- Possession, distribution, or use of alcohol or drugs

- Arrest or involvement with the criminal justice system
- Physical attacks or fights
- Disruptive verbal behavior
- Chronic truancy
- Continual academic failure
- Pregnancy/teen parenthood
- Mental health needs.

One of the major issues states face in creating funding programs for alternative schools is defining them. Our 2010 review of literature and state practice on alternative education provided little guidance for developing a clear definition of alternative education. More recently, and as part of implementing its compulsory attendance laws, Maryland commissioned a study to review state definitions of ALE programs (see Porowski, O'Conner & Luo, 2014). Maryland needed a definition because attendance in an ALE program was an exemption in its compulsory attendance law and the state did not have a clear definition of such programs. The study found great variation across the states in both defining and structuring alternative education programs. Because individual states or school districts define and determine the features of their alternative education programs, they tended to differ in key characteristics, such as target populations, setting, services, and structure.

A formal definition of an ALE program would need to consider the target population (including both grade levels served and types of students), program setting (within a public school or outside such a structure), program offerings (academic, behavioral, counseling, social skills, career counseling, etc.) and structure (how programs are scheduled, staff responsibilities, etc.). The Porowski, O'Conner & Luo (2014) study found wide variation across states (and districts) across all of there four elements.

We have concluded that the 2006 Urban Institute (Aron, 2006) definition of alternative education closely follows our understanding of such programs:

> Alternative education refers to schools or programs that are set up by states, school districts, or other entities to serve young people who are not succeeding in a traditional public school environment. Alternative education programs offer students who are failing academically or may have learning disabilities, behavioral problems, or poor attendance an opportunity to achieve in a different setting and use different and innovative learning methods. While there are many different kinds of alternative schools and programs, they are often characterized by their flexible schedules, smaller teacher-student ratios, and modified curricula.

In 2010, we also reviewed state standards – where such existed – for alternative schools. Most states use definitions similar to that of the Urban Institute, but we only identified one state, Indiana that actually established standards for what an alternative education program might look like. The Indiana Department of Education's (2010) web site states that:

While each of Indiana's alternative education programs is unique, they share characteristics identified in the research as common to successful alternative schools.

- Maximum teacher/student ratio of 1:15
- Small student base
- Clearly stated mission and discipline code
- Caring faculty with continual staff development
- School staff having high expectations for student achievement
- Learning program specific to the student's expectations and learning style
- Flexible school schedule with community involvement and support
- Total commitment to have each student be a success.

We conclude that these characteristics align with the EB view of alternative education programs.

From work in other states, we have found that funding formulas for alternative schools differ substantially. In a few states, the typical staffing ratio for an alternative school is one administrative position for the school plus one teacher position for every eight students. Because alternative high schools are generally designed to serve students who are severely at risk, we recommend they remain relatively small. As a result of the small size of alternative schools, staff at these schools often must fill multiple roles. Many teachers in alternative schools provide many different services for students, including: instruction, pupil support, and counseling services. This suggests that the staffing structure and organization for instruction in Alternative High Schools is usually quite different from that found in typical high schools.

Though Wyoming could consider developing a more formal definition of its ALE system, and a set of standards for ALE programs, it does not need to do so for funding purposes. Because the state's current funding model includes a variety of small school structures, it provides appropriate resources for ALE schools of many sizes, even those that are larger than recommended by the EB model. Thus we conclude that there is no need to conduct a formal recalibration of the funding system for Wyoming's ALE schools; the general funding model supports these schools, particularly the model for schools with less than 49 students, as well as all other non-ALE schools.

Resource Use Analysis

In 2012-13, there were a total of 863 ADM enrolled in 16 alternative schools in Wyoming. These sixteen schools employed 23.3 more total staff then allocated through the model. Specifically, in 2012-13 staffing for these 16 schools varied from the model as shown in the table below. It is important to note that the variation in teachers is a function of the way resources are generated by the model, which as described above, provides funding for one assistant principal position for the school and funding for one teacher position for each 7 students in the school. As a result, the findings reported here show how staff are actually allocated.

Staff Category	2012-13 Difference From The Funding Model
Number of Schools	16.0
Teacher	(39.8)
Librarian	0.7
Media Tech Staff	3.5
Pupil Support	13.2
Aide	19.1
School Admin	(2.6)
Secretary and Clerical - School	22.9
Tutor	5.3
Teacher - Not of Record	1.1
Total Certified Staff Difference	(22.1)
Total Staff Difference	23.3

Source: CRERW

32. Special Education

Providing appropriate education services for students with disabilities, while containing costs and avoiding over-identification of students, particularly minority students, presents several challenges (see Levenson, 2012). Many mild and moderate disabilities, often those associated with students learning to read, are correctable through strategic early intervention. This intervention includes effective core instruction as well as targeted Tier 2 intervention programs, particularly one-to-one tutoring (Elements 8 and 26). For those that require special programs as identified through an IEP, the EB model relies on a census based funding formula that provides additional teaching and aid resources based on the total number of students in a school. As described below, these resources are expected to meet the instructional needs of children with mild and moderate disabilities. For children with severe disabilities, the EB model recommends that the state pay for the entire cost of their programs.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
	100% cost reimbursement		1 teacher for every 150 students in the school 1 aide for every 150 students in the school Federal funds Full state funding for students with severe disabilities To explore this option as part of the 2015 recalibration, WY would need to create a great deal of new data; specifically it would need to separate severe and profound special education expenditures from all others.

Analysis and Evidence

In their book on the best approaches to serve students with disabilities, Frattura and Capper (2007) conclude that both research and most leading educators recommend that educating students in general education environments results in higher academic achievement and more positive social outcomes for students with and without disability labels as well as being the most cost effective way to educate students. Thus, they recommend that school leaders focus their efforts on preventing student underachievement and alter how students who struggle are educated. Doing so, they argue, will overcome the costly and low performance outcomes of multiple pullout programs. Further, fewer students will be inappropriately labeled with a disability, more students will be educated in heterogeneous learning environments, and higher student achievement and a more equitable distribution of achievement will result (Frattura & Capper, 2007).

The core principles of such a proactive approach to teaching students with a disability are that the education system needs to adapt to the student; that the primary aim of teaching and learning is the prevention of student failure; that the aim of all educators is to build teacher capacity; that all services must be grounded in the core teaching and learning of the school; and, that to accomplish this, students must be educated alongside their peers in integrated environments (Frattura & Capper, 2007).

Supporting this argument, research shows that many mild and moderate disabilities, particularly those associated with students learning to read, are correctable through intensive early intervention. For example, several studies (e.g., Borman & Hewes, 2003; Landry, 1999; Slavin, 1996) have documented that through a series of intensive instructional interventions (e.g. small classes, rigorous reading curriculum, 1-1 tutoring), nearly 75 percent of struggling readers identified in kindergarten and grade 1 can be brought up to grade level without the need for placement in special education. Other studies have noted decreases in disability labeling of up to 50 percent with interventions of this type (see for example, Levenson, 2011; Madden, Slavin, Karweit, Dolan & Wasik, 1993; Slavin, 1996).

That is why the EB recommendations for extended learning opportunities (Elements 26, 27 and 28) are so important; they, along with core tutoring and pupil support services, are the series of service strategies that can be deployed before special education services are needed. This sounds like a common sense approach that would be second nature to educators, but in many cases educators have heretofore been rooted in a “categorical culture” that must be corrected through professional development and strong leadership from the district office and the site principal. Using a census approach to providing most of extra resources for students with disabilities, an approach increasing in use across the country, works best for students with mild and moderate disabilities, but only if a functional, collaborative early intervention model (as outlined above) also is implemented.

This proactive approach to special education is evident in the Individuals with Disabilities Education Act (IDEA) of 2004, which changed the law about identifying children with specific learning disabilities. The reauthorized law states that schools will “not be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability ..." (Section 1414(b)). Instead, in the Commentary and Explanation to the proposed special education regulations, the U.S. Department Education encourages states and school districts to abandon the IQ-achievement discrepancy model and adopt Response to Intervention (RTI) models, also discussed above, based on recent research findings (Donovan & Cross, 2002; Lyon et al., 2001; President’s Commission on Excellence in Special Education, 2002; Stuebing et al., 2002). An RTI model, what we call a proactive approach above, identifies students who are not achieving at the same level and rate as their peers and provides appropriate interventions, the first ones of which should be part of the “regular” school program and not funded with special education resources (Mellard, 2004).

The core features of RTI include:

- High quality classroom instruction
- Research-based instruction
- Classroom performance
- Universal screening
- Continuous progress monitoring
- Research-based interventions, that would include 1-1 tutoring
- Progress monitoring during interventions, and
- Fidelity measures (Mellard, 2004).

Common attributes of RTI implementations are: a strong core instructional program for all students, multiple tiers of increasingly intense student interventions, implementation of a differentiated curriculum, instruction delivered by staff other than the classroom teacher, varied duration, frequency, and time of interventions, and categorical or non-categorical placement decisions (Mellard, 2004). This proactive model fits seamlessly into our broader approach to helping all struggling students through early interventions.

In many instances this approach requires school-level staff to change their practice and cease functioning in "silos" that serve children in "pullout" programs identified by funding source for the staff member providing the services (e.g. General Fund, Special Education, Title I). Instead, all staff would team closely with the regular classroom teacher to identify deficits and work together to correct them as quickly as possible. This is a common sense approach that could be second nature in schools, but in many cases schools have heretofore been rooted in a "categorical culture" that must be corrected through professional development and strong leadership from the district office and the site principal.

For children with more severe disabilities, clustering them in specific schools to achieve economies of scale is generally the most effective strategy and provides the greatest opportunity to find ways to mainstream them (to the extent feasible) with regular education students. In very sparsely populated areas this is often not feasible but should be explored. Students in these categories generally include: severely emotionally disturbed (ED); severely mentally and/or physically handicapped; and children within the autism spectrum. The ED and autism populations have been increasing dramatically across the country, and it is likely that this trend will continue in the future. To make the provision of services to these children cost-effective, it makes sense to explore clustering of services where possible and design cost parameters for clustered services in each category. In cases where students need to be served individually or in groups of two or three because of geographic isolation, it would be helpful to cost out service models for those configurations as well, but provide full state funding for those children. This strategy would reduce the likelihood of overwhelming the financial capacity of a small school district that happens to be the home of a child with a severe disability.

The census approach to funding core special education services can be accomplished by providing additional teacher resources at a fixed level – the EB recommendation now is 1.0 teacher and 1.0 aide for every 150 regular student. The census approach emerged across the country for several reasons:

- The continued rise in the number and percentage of "learning disabled" and continued questioning by some of the validity of these numbers
- Under-funding of the costs of severely disabled students
- Over labeling of poor, minority, and ELL students into special education categories, which often leads to lower curriculum expectations, and inappropriate instructional services
- Reduction of paper work

Allocating a fixed census level of staffing (1.0 FTE teachers and 1.0 FTE aides for every 150 students) could meet the needs of children with mild and moderate disabilities if a functional, collaborative early intervention model such as the one outlined above can be implemented. We note that our staffing for the at-risk students discussed for Elements 26-30 – tutoring, extended day, summer school and ELL -- meets this requirement.

Often, the census approach for the high incidence, lower cost students with disabilities is combined with a different strategy for the low-incidence, high-need students, whose costs are funded separately and totally by the state, as these students are not found proportionately in all districts. This is the catastrophic funding for school districts that provides resources for special education students who require services exceeding some figure, such as $15,000 (after Medicaid, federal special education grants, and other available third-party funding is applied).

Today, diverse states such as Alabama, Arkansas, California, Montana, North Dakota, Pennsylvania, and the New England states of Massachusetts and Vermont all use census-based special-education funding systems. Moreover, all current and future increases in federal funding for disabled students are to be distributed on a census basis.

It is possible that Wyoming could enhance the efficiency of its special education program if it moved to a census funding approach. To date the state has concluded that the small size of its many schools and districts would limit funding in many districts creating unanticipated funding and service concerns. As a result, the state continues to provide 100% cost reimbursement for all special education expenses.

Resource Use Analysis

Wyoming reimburses school districts for 100% of approved special education expenditures. Special Education is therefore not part of the Evidence-Based model. For school year 2012-13, school districts were reimbursed $205,042,267 for allowable special education expenditures.

ADDITIONAL ISSUES RELATED TO THE WYOMING FUNDING MODEL

There are several other issues related to the Wyoming Funding system that are not individual elements of the model, but integral aspects of costing the model. These issues include: salary levels, health insurance, other fringe benefits, regional cost adjustments, external cost adjustments and the school district school finance audit process.

33. Salary Levels

The original MAP study in 1997 and the Picus Odden and Associates recalibration in 2005 used previous year's staff salaries to put a salary "price" on each staff element of the funding model. In addition, those studies conducted an analysis of the cost of an additional year of experience for non-professional staff, and an additional year of experience as well as additional education units for professional staff. The latter allows the model to adjust the average salary used to compute each district's funding allocation by the education and experience of the staff in that district, reflecting those differences across school districts in the state. Additionally, in the 2005 study another element for responsibility was added for school and district administrative staff. Between recalibration years, funding model salary levels have been adjusted by external cost adjustments (ECAs) as determined appropriate by the Legislature. The model also continues to account for the experience, education and responsibility for school district staff, where appropriate.

Analysis and Evidence

Between the 2005 and 2010 recalibrations, salaries in the funding formula drew from the amounts established in 2005, and were increased by ECAs in school years 2007-08, 2008-09, and 2009-10. During the 2010 recalibration, it was determined the price of salaries in the funding model had allowed salaries paid by school districts to rise above market based upon a series of salary benchmarking studies. In response, the Legislature adopted a process to monitor the labor market and continue to use an inflation factor to adjust salaries, as appropriate. Since the 2010 recalibration, salaries have been adjusted by ECAs for school year 2013-14 and it is likely another adjustment will occur in school year 2014-15.

It is important to note that use of the salary benchmarking studies and adoption of the funding model monitoring process in 2010 moved the state away from a funding model based upon historical salaries paid by school districts and into one in which the "price" of salaries embedded in the funding model is compared to appropriate labor markets. The 2010 recalibration determined that the salary levels embedded in the funding model exceeded what the labor market demanded. Further, the 2010 recalibration established a process for the Legislature to annually monitor model salaries to ensure they continued to meet or exceed the demands of the market while still providing for experience, education and responsibility cost adjustments for each school district.

It is our conclusion that seeking to determine whether model salaries have been appropriately "inflated" from 2005 – which has been the focus of current discussions about salary levels across the state – is not the most fruitful approach for the 2015 recalibration. Instead, we recommend the state identify an appropriate base salary level using current labor market data and conduct a salary benchmarking analyses to identify where professional and non-professional education staff salaries rank in current, appropriate labor markets. Based upon those analyses, the state can decide where funding model salaries should be placed. The state could decide it wanted funding model salaries to be above, at, or below market levels. With a benchmarking analysis, the state would have the necessary data to make such decisions, and be explicit about them.

If desired, this salary analysis could also include an analysis of whether the state wants to continue to adjust individual district average teacher salaries in the model by education, experience and responsibility, or to move to a different, and perhaps more performance-oriented salary structure.

At a minimum, however, we recommend the state launch an analysis of where education salaries currently lie within the various Wyoming and regional labor markets and determine where in the market funding model salaries should be set.

34. Health Insurance

Wyoming has taken a clear and substantive approach to addressing the costs of health insurance in education staff compensation. As a result, the state has a perspective on how the state education funding system should address the costs of health insurance. Specifically, the state includes in the funding model a dollar amount for health insurance benefits that is the dollar amount the state provides for state employees. The health insurance amounts over the past several years are as follows:

Historical Model Amount for Health Insurance per FTE, School Years 2006-07 to 2015-16.

School Year	Model FTE Amount	Prior Year $ Change	Prior Year % Change
2006-07	$8,169		
2007-08	$9,468	$1,299	15.90%
2008-09	$9,562	$94	0.99%
2009-10	$9,801	$239	2.50%
2010-11	$10,489	$688	7.02%
2011-12	$12,805	$2,316	22.08%
2012-13	$13,180	$376	2.93%
2013-14	$12,523	-$657	-4.99%
2014-15	$13,129	$606	4.84%
(Est.) 2015-16	$14,953	$1,824	13.89%

Source: LSO analysis and calculations of Models.

Analysis and Evidence

This approach to addressing the health care portion of employee benefit costs is sound and we recommend that the state continue this process.

35. Benefits

In determining staff costs, the Wyoming Funding Model uses a base salary for various positions and adds to it benefit costs. Benefits have included health care (discussed above), Social Security and Medicare, worker's compensation, disability and unemployment insurance.

For 2014-15, the costs for these benefits, which are funded inside the model, are as follows:

Benefit Element	Percent of salary
Social Security and Medicare	7.65%
Retirement	12.69% (7.12% employer and 5.57% employee)
Worker's Compensation	0.70%
Unemployment Insurance	0.06%

Analysis and Evidence

Wyoming takes a cost-based approach to all of these benefit costs and we recommend that the state continue this approach.

However, we recommend that the state monitor the following four benefits issues. First, Wyoming has enacted some short-term changes in retirement. At present, 12.69% of salary for retirements benefits, specifically the 7.12 % employer contribution, is funded within the model.

However, the state currently funds short-term changes in these percentages outside the model. In particular, the state is reimbursing school districts an additional 0.625% for employee contributions and 0.50% for employer contributions. For SY 2015-16, the employer contribution will increase another 0.75% and the State will reimburse that cost. In SY 2016-17, the State will reduce the reimbursement for the employee contribution by 0.25%. And in SY 2017-2018 and beyond, the employee contribution reimbursement level will be reduced another 0.375%. These pension cost changes should be monitored on a continual basis.

First, during recalibration the legislature might want to discuss the difference between putting increased district pension costs into the formula with an updated 7.12% figure and reimbursing pension costs outside the formula. Although the reimbursement approach requires less funding, in part because Wyoming districts employ fewer teachers than the model provides, the formula would be "cleaner" if pension costs were just updated annually and included in the benefits component of compensation

Second, the Wyoming Department of Workforce Services is proposing to change the methodology used to calculate the Worker's Compensation rate. Though the 0.70% is appropriate for now, if the percentage changes when the Department of Workforce Services produces a new cost, the state should then incorporate that new figure into the benefit rate included in the model.

Third, the state also should continue to monitor the Unemployment Compensation rate which is currently 0.06% and adjust the model as necessary should that rate change following recalibration.

Fourth, if changes are made in required social security contributions by the Federal government, those changes also should be included in the model.

In general, we would recommend that as changes in these four areas emerge, they should be incorporated into the model in the school year following the year in which the change is identified.

36. Regional Cost Adjustments

Regional cost adjustments are designed to compensate districts for the varying purchasing power of the education dollar across geographic regions of the state, particularly for professional staff salaries.

2010 EB Recommendation	Current Wyoming Policy	Cost Difference	Current EB Recommendation
Adjust model salaries for regional differences by using the 2011 hedonic wage index as calculated by state consultants (Taylor).	Adjust model salaries for regional differences by using the greater of the Wyoming Cost of Living Index (average of the past 6 semiannual calculations) or the 2005 hedonic wage index as calculated by state consultants (Baker via LOP & Associates), with a minimum index value of 1.00.	$6,560,511	Recalibrate.

Analysis and Evidence

Economists and the school finance policy community generally agree that the purchasing power of the education dollar varies across geographic regions of a state. Over the past 30-40 years, therefore, the policy community has developed a variety of approaches to quantify these cost differences to facilitate the use of a "cost index" to adjust state aid allocations to ensure the equal purchasing power of each school district's personnel dollars. For many years, the hedonic wage approach was used to develop such cost indices. During the past ten years, however, a "comparable wage" approach was also developed and has assumed more support among the school finance community.

The 2010 EB recommendation, the hedonic wage approach, seeks to identify various elements in regions/school districts that produce cost increases (dis-amenities) or decreases (amenities) for school districts. These include things like cultural resources (theaters, symphonies, museums, etc.), the cost of living in a specific area, demographic characteristics of the community, etc. The variables that are found to represent the amenities and dis-amenities tend to be controversial, making consensus difficult to reach on what variables and equations should be used to develop the index. The hedonic approach also produces indices for each district.

The comparable wage index (CWI) approach takes a different tact, and avoids the debate over appropriate amenity and dis-amenity variables. The CWI identifies actual wages individuals have accepted to work in various regions of the state, in jobs different from but with similar skills and competencies to education. The notion is that these wages represent the salary differences that must be provided in order to have workers take jobs at fair salaries across regions. These actual comparable wages theoretically incorporate all the amenities and dis-amenities in the various regions. The CWI approach posits that these comparable wages can be used to quantify wage differences needed across regions to ensure equal purchasing power of compensation dollars for education. However, the computation of a CWI would not produce an index for each county in Wyoming. Instead counties would be grouped together in regional labor markets.

In addition, Wyoming has developed a "cost of living" index (the Wyoming Cost of Living Index or WCLI) across regions and districts. Though a cost of living index reflects the variable costs to families of the market basket of goods families purchase across geographic areas, it does not reflect the market basket of goods that school districts purchase. As a result it has not received support from the school finance policy community for use as a regional cost adjustment. Despite this, the WCLI continues to be used in the Legislature's funding model.

Both the hedonic and comparable wage approach produce an index, with an average of 1.0. Districts with indices below 1.0 would have their personnel resources reduced to adjust for lower costs and districts with indices above 1.0 would have their personnel resources increased to adjust for higher costs. These adjustments have led to debate on the efficacy of the indices not only in Wyoming but also other states. The WCLI also has values below and above 1.0.

The Legislature's funding model uses a cost adjustment factor that is the greater of the hedonic wage index that was developed in 2005 or the Wyoming Cost of living index, with a minimum index of 1.0. We view this approach as more a compromise policy than a clean regional cost adjustment.

We continue to recommend that the state use one cost adjustment, with values both above and below 1.0. However, it is recommended that this element is further investigated and recalibrated to find the appropriate approach.

37. External Cost Adjustments

External cost adjustments are factors used to adjust the cost-basis of model elements to ensure the state continues to provide the statutorily required educational program to Wyoming school children in the time period in between the formal recalibrations, now scheduled for every five years.

Up until recently, state practice has been for the legislature to consider external cost adjustments annually, though the 2014 legislature enacted ECAs for both 2014-15 and 2015-16.

Following the 2010 recalibration, Wyoming developed what is likely the most sophisticated ECA approach in the country:

- One for professional staff, using a Wyoming specific Comparable Wage Index
- One for non-professional staff, using a Wyoming specific High School Comparable Wage Index
- One for materials, using the Producer Price Index for Office Supplies and Accessories

- One for energy, using the Producer Price Index for Commercial Electric Power (weighted at 44.1%) and the Producer Price Index for Commercial Natural Gas (weighted at 55.9%).

Analysis and Evidence

Though the state has used four different ECAs for the past several years, it has not been consistent in using them to adjust the Legislature's funding model elements on an annual basis. On the other hand, the state has adjusted the appropriate elements of the cost-based model so that it continues to represent the best possible estimate of education costs in Wyoming. To date, the Legislature's funding model has provided more revenues to school districts than the cost-based model.

Underneath this debate is the reality that the Legislature adopted a set of formulas, prices and ratios for the Legislature's funding model that are more generous than that required by the cost-based model as required by the Courts. Examples include the difference in class size ratios for core classes and elective teachers, and the minimum numbers of teachers resourced in small schools and districts.

The 2014 Monitoring Report shows that the total resources provided by the Legislature's funded model exceeds that required by the cost-based model, even when the ECA is not allocated each year to the Legislature's funded model. Because of this reality, our conclusion from these data is that the state is providing the level of resources identified by the cost-basis that is necessary for districts to offer the statutorily required educational program to Wyoming school children.

Our recommendation is that the state should continue to use the four cost indices, and apply them annually to the cost-based (EB) model, and continue its monitoring process approach for applying an ECA to the Legislative funding model if the EB model is not adopted.

38. School District School Finance Audit Process

The operation of the Wyoming funding model requires the use of several pieces of data at both school and district levels. In order for the formulas to work as legislatively intended, every data element in the formula must be accurate. To ensure this is the case, each year the Department of Audit conducts audits in a sample of school districts to ensure that the data provided for the funding model are accurate. Several data points are audited, including, for example, the following:

- Number of students
- Number of CTE students, and number of CTE teachers
- Average teacher experience and education units
- Number of buildings, square footage, etc.
- Special education and transportation expenditures.

The audit findings are then sent to the Wyoming Department of Education. When the audit identifies errors in the audited numbers, it is the Department's responsibility to enforce changes in state aid allocations – to either increase or decrease district funding depending on the audit finding.

This clearly is a needed process and should continue. No funding formula can work as intended unless the data it uses are accurate.

We strongly recommend that the school district school finance audit process be continued. We further recommend that the Department of Education revisit the rules and guidance concerning the data it needs from each district to operate the funding formula. Revised rules should clearly define every data element of the funding model and provide clear guidelines on how districts should produce those data so that every district, the Audit Department and the Department of Education has the same understanding of what data should be reported and audited.

GLOSSARY OF FUNDING MODEL ELEMENTS

Model Element	Page Number	Definition
Core Teachers	32 (elementary) 35 (secondary)	Core teachers are the grade-level classroom teachers in elementary schools and the core subject teachers in middle and high schools (e.g., mathematics, science, language arts, social studies and world language, including such subjects taught as Advanced Placement in high schools).
Elective Teachers	37	Elective teachers as all teachers for subject areas not included in the core, including such classes as art, music, physical education, health, and career and technical education, etc. However, some career technical classes can substitute for core math and science classes.
Instructional Coaches	44	Instructional coaches, sometimes called mentors, site coaches, curriculum specialists, or lead teachers, coordinate the school-based instructional program, provide the critical ongoing instructional coaching and mentoring that the professional development literature shows is necessary for teachers to improve their instructional practice, do model lessons, and work with teachers in collaborative teams using data to improve instruction.
Tutors	46 (core) 82 (struggling students)	Tutors, or Tier II Interventionists, are licensed teachers who, during the regular school day, provide 1-1 or small group (no larger than 5) tutoring to students struggling to meet proficiency in core subjects.
Extended day Programs	85	Extended day programs provide academic extra help to students outside the regular school day before and after school.
Summer School	87	Summer school includes all programs provided during the summer months, i.e., outside the regular school year, largely focusing on academic deficiencies of students but includes a wider array of classes for high school students
At-risk Students	81	The unduplicated count of students eligible for free and reduced price lunch, ELL and mobile students. The proposed resources triggered by At-

Model Element	Page Number	Definition
		Risk students would include all resources for tutors (Tier 2 Interventionists), extended day programming, summer school, and additional pupil support.
English Language Learner services	89	ELL students are those who come from homes where English is not the native language and who perform at Levels 1, 2 and 3 in English; in addition to the At-Risk resources, the model provides resources to provide English as a Second Language services for these students.
Special Education	95	Programs for all students with disabilities.
Alternative Schools	92	Alternative Schools provide services, usually outside of the regular school environment, to students who have some combination of significant behavioral, social and emotional issues, often including alcohol or drug addictions. These students are different from at-risk students and require a different set of services.
Gifted, Talented	61	Gifted and talented students are those who perform in the very top levels of performance, and can handle much more than a year of academic work in a regular school year.
Substitute Teachers	50	These are regular substitute teachers.
Student Support, Guidance Counselors, Nurses	51 (core) 83 (struggling students)	These include guidance counselors, social workers, psychologists, family outreach workers, nurses, etc. Guidance counselors and nurses are provided for all students and additional student support staff are provided in the struggling students section.
Duty/Supervisory Aides	53	These are non-licensed individuals who monitor the hallways, doors and playgrounds, and supervise the lunchroom.
Librarians	55	These are regular school librarians.
Principal, Assistant Principal	57	These are regular school principals and assistant principals.
Professional Development	64	Professional development includes all training programs for licensed staff in schools including professional development for implementing new curriculum programs, sheltered English instructional strategies for ELL students, gifted and talented, etc. It

Model Element	Page Number	Definition
		also includes assistance to teachers working in collaborative groups and ongoing coaching of teachers in their individual classrooms. Resources include instructional coaches, 10 pupil-free days for training, and $100 per pupil for trainers and other expenses.
School-Based Technology and Equipment	70	These include within school technology such as computers, servers, network equipment, copiers, printers, instructional software, security software, some curriculum management courseware, etc.
Instructional Materials	67	This includes textbooks, consumable workbooks, laboratory equipment, library books and other relevant instructional materials.
Interim-, Short-Cycle Assessments	67	These include benchmark, progress monitoring, formative, diagnostic and other assessments teachers need in addition to state accountability assessment data.
Student Activities	73	This includes on-credit producing after-school programs, including clubs, bands, sports, and other such activities.
Central Office Administration	78	This is a per pupil amount developed for a prototypical school district of 3900 students and includes all typical central office staff such as superintendent, assistant superintendents, curriculum director, special education, the business and HR functions, assessment & technology, and a director of operations/maintenance.
Operations and Maintenance	75	Covers functions such as custodial services, grounds maintenance and facilities maintenance and minor repairs.

REFERENCES

(Those with an asterisk * refer to randomized controlled trials.)

Alexander, K.L., & Entwisle, D.R. (1996). Schools and children at risk. In A. Booth, & J.F. Dunn (Eds.). *Family-school links: How do they affect educational outcomes?* (pp.67-89). Mahwah, NJ: Lawrence Erlbaum Associates.

Andrews, M., Duncombe, W., & Yinger, J. (2002). Revisiting economies of size in American education: Are we any closer to a consensus. *Economics of Education Review, 21*(3), 245-262.

APPA. (1998). *Custodial Staffing Guidelines for Educational Facilities (2nd Ed.).* Alexandria, VA: APPA.

APPA. (2001). *Operational Guidelines for Grounds Management*. Alexandria, VA: APPA National Recreation and Park Association, Professional Grounds Management Society.

APPA. (2002). *Maintenance Staffing Guidelines for Educational Facilities* . Alexandria, VA: APPA.

Archambault, F.X., Jr., Westberg, K.L., Brown, S., Hallmark, B.W., Zhang, W., & Emmons, C. (1993). Regular classroom practices with gifted students: Findings from the Classroom Practices Survey. *Journal for the Education of the Gifted, 16*, 103-119.

Aron, L. Y. (2006). *An Overview of Alternative Education*. Washington, DC: The Urban Institute. **http://www.urban.org/UploadedPDF/411283_alternative_education.pdf**

Ascher, C. (1988). Summer school, extended school year, and year-round schooling for disadvantaged students. *ERIC Clearinghouse on Urban Education Digest*, *42,* 1-2.

Battaglino, Tamara Butler, Haldeman, Matt, & Laurans, Eleanor. (2012). *The costs of online learning.* Dayton, OH: Thomas Fordham Institute.

Black, Paul, & William, Dylan. (1998). Inside the Black Box: Raising standards through classroom assessments. *Phi Delta Kappan,* 80(2), 139-148.

Blankstein, A. (2010). *Failure Is Not An Option, 2nd Edition*. Thousand Oaks: Corwin Press.

Blankstein, A. (2011). *The Answer is in the Room: How Effective Schools Scale Up Student Success*. Thousand Oaks: Corwin Press.

Bleske-Rechek, A., Lubinski, D., & Benbow, C.P. (2004). Meeting the educational needs of special populations: Advanced Placement’s role in developing exceptional human capital. *Psychological Science, 15*(4), 217-224.

Borman, G.D. (2001). Summers are for learning. *Principal, 80*(3), 26-29.

Borman, G.D.& Boulay, M. Eds. (2004). *Summer learning: Research, policies and programs*. Mahwah, NJ: Lawrence Erlbaum Associates.

*Borman, Geoffrey D., & Dowling, Maritza. (2006). The longitudinal achievement effects of multi-year summer school: Evidence from the Teach Baltimore randomized field trial. *Educational Evaluation and Policy Analysis, 28*, 25-48.

*Borman, G., Goetz, M., & Dowling, M. (2009). Halting the summer achievement slide: A randomized evaluation of the *KindergARTen* Summer Camp. *Journal of Education for Students Placed At Risk, 14*(2), 133-147.

Borman, Geoffrey D., Hewes, Overman, Laura & Brown, Shelly. (2003). Comprehensive school reform and achievement: A meta-analysis. *Review of Educational Research*, *73*(2), 125-230.

Borman, G., Rachuba, L., Hewes, G., Boulay, M., & Kaplan, J (2001). Can a summer intervention program using trained volunteer teachers narrow the achievement gap? First-year results from a multi-year study. *ERS Spectrum, 19*(2), 19-30.

Boudett, Kathryn Parker, Elizabeth A. City & Richard Murnane. (2007). *A Step-by-Step Guide to Using Assessment Results to Improve Teaching and Learning*. Cambridge: Harvard Education Press.

Brabeck, M.M., Walsh, M.E., & Latta, R. (2003). *Meeting at the hyphen: Schools-universities-communities-professions in collaboration for student achievement and well being*. *The One-hundred and second yearbook of the National Society for the Study of Education, Part II*. Chicago: National Society for the Study of Education.

Bransford, J., Brown, A., & Cocking, R. (1999). *How people learn*. Washington, DC: National Academy Press.

Capizzano, J., Adelman, S., & Stagner, M. (2002). *What happens when the school year is over? The use and costs of child care for school-age children during the summer months*. (Assessing the New Federalism, Occasional Paper, No. 58). Washington, D.C.: Urban Institute.

*Carlson, Deven, Borman, Geoffrey D., & Robinson, Michelle. (2011). A multistate district-level cluster randomized trial of the impact of data-driven reform on reading and mathematics achievement. *Educational Evaluation and Policy Analysis, 33*(3), 378-398.

Carver, P.R., and Lewis, L. (2010). *Alternative Schools and programs for Public School Students At Risk of Educational Failure: 2007-08* (NCES 2010-026). U.S. Department of Education, National Center for Education Statistics. Washington, DE: Government printing Office.

Chenoweth, Karen. (2007). *It's Being Done: Academic Success in Unexpected Schools* (Harvard Education Press

Chenoweth, Karen. (2009). *How It's Being Done: Urgent Lessons from Unexpected Schools* Harvard Education Press.

Clark, Kevin. (2009). The case for structured English immersion. *Educational Leadership, 66*(7), 42-46.

Cohen, P., Kulik, J., & Kulik, C. (1982). Educational outcomes of tutoring: A meta-analysis of findings. *American Educational Research Journal, 19*(2), 237-248.

*Cook, Phillip, Kenneth Dodge, George Farkas, Roland G. Fryer, Jr, Jonathan Guryan, Jens Ludwig, Susan Mayer, Harold Pollack and Laurence Steinberg. (2014). *The (surprising) efficacy of academic and behavioral intervention with disadvantaged youth: Results from a randomized experiment in Chicago. Working Paper 19862*. Cambridge, MA: National Bureau of Economic Research.

Cooper, H, Charlton, K., Valentine, J.C., & Muhlenbruck, L. (2000). Making the most of summer school: A meta-analytic and narrative review. *Monographs of the Society for Research in Child Development, 65* (1, Serial No. 260).

Cooper, H., Nye, B., Charlton, K., Lindsay, J., & Greathouse, S. (1996). The effects of summer vacation on achievement test scores: A narrative and meta-analytic review. *Review of Educational Research, 66,* 227-268.

Cooper, Harris, Batts-Allen, Ashley, Patall, Erika A., & Dent, Any L. (2010). Effects of full-day kindergarten on academic achievement and social development. *Review of Educational Research*, 80(1), 34-70.

Cornett, J. & Knight, J. (2008). Research on coaching. In J. Knight, Ed., *Coaching: Approaches and Perspectives (pp. 192-216).* Thousand Oaks, CA: Corwin.

Crow, Tracy, (Ed.) (2011). Standards for professional learning. *Journal of Staff Development, 32*(4), Special Issue.

Decotis, J. & Tanner, C. (1995). The effects of continuous-progress nongraded primary school programs on student performance and attitudes toward learning. *Journal of Research and Development in Education.* 28: 135-143.

Denton, K., West, J., & Walston, J. (2003). *Reading—Young children's achievement and classroom experiences: Findings from the Condition of Education 2003*. Washington, DC: National Center for Education Statistics.

Donovan, S. & J. Bransford. (2005a). *How students learn – history in the classroom*. Washington, DC: National Research Council.

Donovan, S. & J. Bransford. (2005b). *How students learn – mathematics in the classroom*. Washington, DC: National Research Council.

Donovan, S. & J. Bransford. (2005c). *How students learn – science in the classroom*. Washington, DC: National Research Council.

Donovan, S., & Cross, C. (2002). *Minority students in special and gifted education*. Washington, DC: National Academy Press.

DuFour, R., DuFour, R., Eaker, R. & Many, T. (2010). *Learning by doing: A handbook for professional communities at work*. Bloomington, IN: Solution Tree Press.

Duncombe, W., & Yinger, J. (2007). Does School District Consolidation Cut Costs? *Education Finance and Policy,* 2(4), 341-375.

Duncombe, W. D., & Yinger, J. M. (2010). School district consolidation: The benefits and costs. *The School Administrator, 67*(5), 10-17.

Educational Research Service. (2009). *Staffing patterns in public school systems: Current status and trends, update 2009*. Alexandria, VA: Educational Research Service, www.ers.org. Downloaded September 3, 2010.

Elbaum, B., Vaughn, S., Hughes, M.T., & Moody, S.W. (1999). Grouping practices and reading outcomes for students with disabilities. *Exceptional Children, 65*, 399-415.

Elicker, J. & Sangeeta Mathur. (1997). What do they do all day? Comprehensive evaluation of a full day kindergarten. *Early Childhood research Quarterly*, 12(4), 459-480.

Farkas, G. (1998). Reading one-to-one: An intensive program serving a great many students while still achieving. In Jonathan Crane, (Ed.), *Social programs that work*. New York: Russell Sage Foundation.

Fashola, O. S. (1998). *Review of extended-day and after-school programs and their effectiveness* [Report No. 24]. Washington, DC: Center for Research on the Education of Students Placed at Risk (CRESPAR), Howard University.

Feldman, A.F. & Matjasko, J.L. (2005). The role of school-based extracurricular activities in adolescent development; A comprehensive review and future directions. *Review of Educational Research, 7*5(2), 159-210.

Field, Gara Brooke, (2007). *The effect of using Renzulli Learning on student achievement: An investigation of internet technology on reading fluency and comprehension*. Storrs, CT: University of Connecticut, Neag School of Education, National Research Center on the Gifted and Talented.

Finn, J. (2002). Small classes in America: Research, practice, and politics. *Phi Delta Kappan*, *83*(7), 551-560.

*Finn, J.D. & Achilles, C.M. (1999). Tennessee's class size study: Findings, implications, misconceptions. *Educational Evaluation and Policy Analysis, 21*, 97-109.

*Finn, J. D., Gerger, S.B., Achilles, C. M., & Zaharias, J.B. (2001). The enduring effects of small classes. *Teachers College Record*, *103*(2), 145-183.

Florida Department of Education (2014). Maintenance and Operations Administrative Guidelines for School Districts and Community Colleges. Tallahassee, FL: Florida Department of Education, available at http://www.fldoe.org/edfacil/pdf/5_0.pdf. Last accessed October 29, 2014.

Fox, W. F. (1981). Reviewing economies of size in education. *Journal of Education Finance*, *6*(3), 273-296.

Frattura, E. & Capper, C. (2007). Leading for Social Justice: Transforming Schools for All Learners. Thousand Oaks, CA: Corwin Press.

Fusaro, J. A. (1997). The effect of full-day kindergarten on student achievement: A meta-analysis, *Child Study Journal*, *27*(4), 269-277.

Gallagher, J. (1996). The strange case of acceleration. In C. Benbow & D. Lubinski (Eds.), *Intellectual talent* (pp. 83-92). Baltimore: Johns Hopkins Press.

Gallagher, J. (2002). *Society's role in educating gifted students: The role of public policy* (RM02162). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Gallagher, J., & Coleman, M.R. (1992). *State policies on the identification of gifted students from special populations: Three states in profile*.

Gallagher, S., & Stepien, W. (1996). Content acquisition in problem-based learning: Depth versus breadth in American studies. *Journal for the Education of the Gifted*, *19*, 257-275.

Gallagher, S., Stepien, W., & Rosenthal, H. (1992). The effects of problem-based learning on problem solving. *Gifted Child Quarterly*, *36*, 195-200.

Gandara, Patricia, & Rumberger, Russell W. (2008). Defining an adequate education for English learners. Education Finance and Policy, 3(1), 130-148.

Gandara, Patricia, Rumberger, Russel, Maxwell-Jolly, Julie, & Callahan, Rebecca. (2003). English learners in California schools: Unequal resources, unequal outcomes. Education Policy Analysis Archives, 11(3).

Garet, M.S., Porter, A., Desimone, L., Birman, B., & Yoon, K. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, *38*(4), 915-945.

*Gerber, S., Finn, J., Achilles, C., & Boyd-Zaharias, J. (2001). Teacher aides and students' academic achievement. *Educational Evaluation and Policy Analysis, 23*(2), 123-143.

Gersten, Russell, Ed. (2006). Elementary School Journal. Entire Issue.

Gordon, Edwin E. (2009). 5 ways to improve tutoring programs. *Phi Delta Kappan,* 90(6), 440-445.

*Grissmer, D. (1999). Class size: Issues and new findings. *Educational Evaluation and Policy Analysis*, *21*(2). [Entire Issue].

Gullo, D. (2000). The long-term effects of full-school-day kindergarten on student achievement: A meta-analysis. *Early Child Development and Care, 160*(1), 17-24.

Gutierrez, Roberto & Robert Slavin. (1992). Achievement Effects of the Nongraded Elementary School: A Best Evidence Synthesis. *Review of Educational Research*, 62(4), 333-376.

Hakuta, Kenji. (2011). Educating language minority students and affirming their equal rights: Research and practical perspectives. *Educational Researcher, 40*(4), 163-174.

Hansen, J., & Feldhusen, J.F. (1994). Comparison of trained and untrained teachers. *Gifted Child Quarterly, 38*(3), 115-121.

Hanushek, E. (2002). Evidence, politics and the class size debate. In L. Mishel & R. Rothstein (Eds.), *The class size debate (pp. 37-65)*. Washington, DC: Economic Policy Institute.

Indiana Department of Education. *Alternative Education Programs*. http://www.doe.in.gov/alted/altedlinkpg.html. Downloaded September 2010.

James-Berdumy, S., Dynarski, D., & Deke, J. (2005). *When Elementary Schools Stay Open Late: Results from The National Evaluation of the 21st Century Community Learning Centers Program.* Washington, D.C.: Mathematica Policy Research, Inc.

Jimenez-Castellanos, Oscar & Topper, Amelia M. (2012). The cost of providing an adequate education to English language learners: A review of the literature. *Review of Educational Research, 82*(2), 179-232.

Joyce, Bruce, & Calhoun, E. (1996). *Learning experiences in school renewal: An exploration of five successful programs*. Eugene, OR: ERIC Clearinghouse on Educational Management.

Joyce, Bruce & Showers, B. (2002). *Student achievement through staff development (3rd Ed.).* Alexandria, VA: Association for Supervision and Curriculum Development.

Kataoka, Sabrina & Deborah Lowe Vandell (2013) Quality of Afterschool Activities and Relative Change in Adolescent Functioning Over Two Years, *Applied Developmental Science*, 17:3, 123-134, DOI: 10.1080/10888691.2013.804375

Kauerz, Kristie. (2005). *Full day kindergarten: A study of state policies in the United States*. Denver, CO: Education Commission of the States.

Kim, J.S. & Quinn, D.M. (2013). The effects of summer reading on low-income children's literacy achievement from kindergarten to grade8: A meta-analysis of classroom and home interventions. *Review of Educational Research*, 83(3), 386-431.

Kirst, M. & Venezia, A., Eds (2004). *From High School to College - Improving Opportunities for Success in Postsecondary Education*. San Francisco: Jossey-Bass.

Kleiner, B., Nolin, M.J., & Chapman, C. (2004). *Before and After School Care Programs, and activities through eighth grade: 2001*. Washington, D.C.: U.S. Department of Education, National Center for Education Statistics.

Konstantopulos, Spyros, & Chung, Vicki. (2009). What are the long term effects of small classes on the achievement gap? Evidence from the lasting benefits study. *American Journal of Education*, *116*(November), 125-154.

*Krueger, A. (2002). Understanding the magnitude and effect of class size on student achievement. In L. Mishel & R. Rothstein (Eds.), *The class size debate (pp. 7-35).* Washington, DC: Economic Policy Institute.

*Krueger, A. B., & Whitmore, D.M. (2001). *Would smaller classes help close the Black-White achievement gap? (*Working paper #451). Princeton, NJ: Princeton University. [On-line]. Available: http://www.irs.princeton.edu/pubs/pdfs/451.pdf.

Kulik, J.A., & Kulik, C.C. (1984). The effects of accelerated instruction. *Review of Educational Research*, *54*(3), 409-425.

Kulik, James & Chen-Lin Kulik. (1992). Meta-analytic findings on grouping programs. *Gifted Child Quarterly*, *36*(2), 73-77.

Lance, K. C., & Hofschire, L. (2012). *Change in school librarian staffing linked to change in CSAP reading performance, 2005 to 2011*. Denver, CO: Library Research Service.

Lee, V., & Smith, J. (1997). High school size: Which works best, and for whom? *Educational Evaluation and Policy Analysis*, *19*(3), 205-228.

Lee, V.E., Burkam, D.T., Ready, D.D., Honigman, J. & Meisels, S.J. (2006). Full-day versus half-day kindergarten: In which program do children learn more? *American Journal of Education*, 11(2), 163-208.

Levenson, Nathan. (2011). *Something has got to change: Rethinking special education, Working Paper 2011-01*. Washington, D.C.: American Enterprise Institute.

Levenson, Nathan. (2012). *Boosting the quality and efficiency of special education*. Dayton, OH: Thomas Fordham Institute.

Lockwood, J.R., McCombs, Jennifer Sloan, & Marsh, Julie. (2010). Linking reading coaches and student achievement: Evidence from Florida middle schools. *Educational Evaluation and Policy Analysis*, *32*(3), 372-388.

Lyon, G. R., Fletcher, J. M., Shaywitz, S. E., Shaywitz, B. A., Torgesen, J. K., Wood, F. B., et al. (2001). *Rethinking Learning Disabilities*. Washington, DC: Thomas Fordham Foundation. URL: http://www.edexcellence.net/library/special_ed/index.html

Madden, Nancy A., Slavin, Robert, Karweit, Nancy, Dolan, Lawrence J., & Wasik, Barbara A. (1993). Success for all: Longitudinal effects of a restructuring program for inner-city elementary schools, American Educational Research Journal, 30: 123–148.

Marsh, Julie A., McCombs, Jennifer Sloan, & Martorell, Francisco. (2010). How instructional coaches support data-driven decision making. *Educational Policy*, ***24***(6), 872-907.

*May, Henry, Abigail Gray, Jessica Gillespie, Philip Sirindes, Cecile Sam, Heather Goldsworth, Michael Armijo & Namrata Tognatta. (2013). *Evaluation of the i3 Scale-up of Reading Recovery*. Philadelphia: University of Pennsylvania. Downloaded July 2014 at http://www.cpre.org/sites/default/files/researchreport/1488_readingrecoveryreport.pd

McCombs, J. S., Augustine, C. H., Schwartz, H. L., Bodilly, S. J., McInnis, B., Lichter, D. A., & Cross, A. B. (2011). *Making Summer Count: How Summer Programs Can Boost Children's Learning*. Santa Monica, CA: RAND Corporation. Retrieved December 3, 2013, from, http://www.rand.org/pubs/monographs/MG1120.htm

Mellard, D. (2004). *Understanding Responsiveness to Intervention in Learning Disabilities Determination*. Lawrence, Kansas: National Research Center on Learning Disabilities. Retrieved January 17, 2007 at: http://nrcld.org/publications/papers/mellard.pdf

Michie, Joan, & Holton, Barbara. (2005). Fifty years of supporting children's learning: A history of public school libraries and federal legislation from 1953 to 2000 (NCES 2005-311). U.S. Department of Education. National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Miller, Samuel D. (2003). Partners in Reading: Using classroom assistants to provide tutorial assistance to struggling first-grade readers. *Journal of Education for Students Placed At Risk*, *8*(3), 333-349.

Mishel, Lawrence & Rothstein, R. (Eds.). (2002). *The class size debate*. Washington, DC: Economic Policy Institute.

Monk, D. (1990). *Educational finance: An economic approach*. New York: McGraw-Hill.

*Mosteller, F. (1995). The Tennessee study of class size in the early school grades. *The Future of Children: Critical Issues for Children and Youths*, *5*, 113-127.

Mutter, Davida & Randolph. (1987). A Step-By-Step Plan for an Inhouse Maintenance Audit of School Buildings, *Educational Facility Planner*, (25)4, July-August.

National Center for Educational Statistics. (2013) *Characteristics of Public Elementary and Secondary School Library Media Centers in the United State: Results from the 2011-12 Schools and Staffing Survey*. Washington, DC. Available at: http://nces.ed.gov/pubs2013/2013315.pdf (last accessed August 22, 2014).

National Education Commission on Time and Learning. (1994). *Prisoners of time.* Washington, DC: Author.

Nelli, Robert. (2006, May). *Operations and maintenance adequacy in California public schools: An evidence-based approach*. Dissertation. Los Angeles, CA: Rossier School of Education, University of Southern California.

*Nye, B. A., L. V. Hedges, & S. Konstantopulos. (2001a). The long-term effects of small classes in early grades: Lasting benefits in mathematics achievement at grade nine. *Journal of Experimental Education*, *69*(3), 245-258.

*Nye, B. A., L. V. Hedges & S. Konstantopulos. (2001b). Are effects of small cumulative: Evidence from a Tennessee experiment, *Journal of Educational Research*, *94*(6), 336-345.

*Nye, B., Hedges, L.V., & Konstantopoulos, S. (2002). Do low-achieving students benefit more from small classes? Evidence from the Tennessee class size experiment. *Educational Evaluation & Policy Analysis 24*(3), 201-217.

Odden, A. (1997). How to rethink school budgets to support school transformation. *Getting better by design series, Volume 3.* Arlington, VA: New American Schools.

Odden, Allan. (2009). *Ten strategies for doubling student performance*. Thousand Oaks, CA: Corwin Press.

Odden, Allan. (2011a). *Strategic management of human capital in education*. New York: Routledge Press

Odden, Allan. (2011b). The dollars and sense of comprehensive professional learning. *Journal of Staff Development,* 32(4), 26-32.

Odden, Allan. (2012). *Improving student learning when budgets are tight*. Thousand Oaks, CA: Corwin Press.

Odden, A. & Archibald, S. (2009). *Doubling Student Performance and Finding the Resources to Do It.* Thousand Oaks, CA: Corwin Press.

Odden, Allan, & Picus, Lawrence O. (2014). *School Finance: A Policy Perspective, 5th edition*. New York: McGraw-Hill.

Pavan, Barbara. (1992). Recent research on nongraded schools: The benefits of nongraded Schools. *Educational Leadership*, 50(2), 22-25.

Phelps, L. Allen. (2006). *Career and technical education in Wisconsin's new economy: Challenges and investment imperatives*. Madison: University of Wisconsin, Wisconsin Center for Education Research, Consortium for Policy Research in Education**.**

*Pianta, Robert, Allen, Joseph, & King, High. (2011). An interaction-based approach to enhancing secondary school instruction and student achievement, *Science*, 333 (6045), 1034-1037.

Picus, Lawrence O. & Odden, Allan. (2010). *2010 Cost of Education Study: Submitted to the Select School Finance Committee of the Wyoming State Legislature*. Los Angeles, CA: Lawrence O. Picus and Associates. Available at: http://www.lpicus.com

Picus, Lawrence O., Odden, Allan, Goetz, Michael, & Aportela, Anabel. (2012). *Estimating the cost of an adequate education for Texas school districts using the evidence-based approach.* North Hollywood, CA. SED Lawrence O. Picus and Associates.

Picus, Lawrence O., Allan Odden, William Glenn, Michael Griffith & Michael Wolkoff. (2011). *An Evaluation of Vermont's Education Finance System.* Los Angeles, CA: Picus Odden and Associates. Available at www.picusodden.com under policy impact.

Picus, Lawrence O., Allan Odden, Michael Goetz, Anabel Aportela & Michael Griffith. (2013). *An Independent Review of Maine's Essential Programs and Services Funding Act, Part 2*. Los Angeles, CA: Picus Odden and Associates. Available at www.picusodden.com under policy impact.

Picus, Lawrence O., & Seder, Richard. (2010). Recalibration of maintenance and operation costs. In Lawrence O. Picus & Allan Odden. *2010 Cost of Education Study: Submitted to the Select School Finance Committee of the Wyoming State Legislature*. Los Angeles, CA:

Lawrence O. Picus and Associates. Available at: www.picusodden.com under policy impact.

Porowski, Allan, O'Conner, Rosemarie, & Luo, Jia Lisa. (2014). *How Do States Define Alternative Education?* (REL 2014–038). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Mid-Atlantic. Retrieved from http://ies.ed.gov/ncee/edlabs.

Posner, J., & Vandell, D. L. (1994). Low-income children's after-school care: Are there beneficial effects of after-school programs? *Child Development, 65,* 440-456.

President's Commission on Excellence in Special Education (2002). *A new era: Revitalizing special education for children and their families.* Washington, DC: US Department of Education.

Raudenbusch, Steve. (2009). The Brown Legacy and the O'Connor Challenge: Transforming schools in the images of children's potential. *Educational Researcher,38*(3), 169–180.

Ravitch, D. (2004). The mad, mad world of textbook adoption. Fordham Institute. Maryland: District Creative Printing. Also available at www.edexcellence.net.

Raywid, M.A. (1997/1998). Synthesis of research: Small schools: A reform that works. *Educational Leadership, 55*(4), 34-39.

Reis, S.M., & Purcell, J.H. (1993). An analysis of content elimination and strategies used by elementary classroom teachers in the curriculum compacting process. *Journal for the Education of the Gifted, 16*(2), 147-170.

Reis, S.M., Westberg, K.L., Kulikowich, J., Caillard, F., Hebert, T., Plucker, J., Purcell, J.H., Rogers, J.B., & Smist, J.M. (1993). Why not let high ability students start school in January? The curriculum compacting study (RM93106). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

*Roberts, Greg (2000, September). *Technical Evaluation Report on the Impact of Voyager Summer Programs*. Austin, TX: University of Texas.

Robinson, A., & Clinkenbeard, P.R. (1998). Giftedness: An exceptionality examined. *Annual Review of Psychology*. *49*(1), 117-139.

Rodney, M. J., Lance, K. C., & Hamilton-Pennell, C. (2003). *The Impact of Michigan school librarians on academic achievement: Kids who have libraries succeed*. Lansing, MI: Library of Michigan.

Rowan, B., Correnti, R. & Miller, R.J.(2002). What large-scale, survey research tells us about teacher effects on student achievement: Insights from the *Prospects* Study of Elementary Schools. *Teachers College Record*, *104*(8), 1525-1567.

Seder, R. (2012). *Review and Evaluation of the Method to Calculate School Building Capacity*. Report the Wyoming School Facilities Department. mimeo, June, 2012.

Shanahan, T. (1998). On the effectiveness and limitations of tutoring in reading. *Review of Research in Education, 23, 217-234*. Washington, DC: American Educational Research Association.

Shanahan, T, & Barr, R. (1995). Reading recovery: An independent evaluation of the effects of an early instructional intervention for at-risk learners. *Reading Research Quarterly*, *30*(4), 958-997.

Slavin, R. (1987). Ability Grouping and Student Achievement in Elementary Schools: A Best Evidence Synthesis. *Review of Educational Research,* 57: 293-336.

Slavin, Robert. (1992). The Nongraded Elementary School: Great Potential But Keep it Simple. Educational Leadership, 50(2), 24-24.

Slavin, R. E. (1996). Neverstreaming: Preventing learning disabilities. *Educational Leadership*, *53*(4), 4-7.

Slavin, R.E., Karweit, N., & Wasik, B. (1994). *Preventing early school failure: Research policy and practice*. Boston: Allyn & Bacon.

Slavin, R, & Cheung, A. (2005). A synthesis of research on language of reading instruction for English language learners. *Review of Educational Research*, *75*(2), 247-284.

*Slavin, Robert E., Madden, Nancy, Calderon, Margarita, Chamberlain, Anne, & Hennessy, Megan. (2011). Reading and language outcomes of a multi-year randomized evaluation of transitional bilingual education. *Educational Evaluation & Policy Analysis, 33*(3), 47–58.

Southern, W.T., Jones, E.D., & Stanley, J.C. (1993). Acceleration and enrichment: The context and development of program options. In K.A. Heller, F.J. Monks & A.H. Passow (Eds.), *International handbook of research and development of giftedness and talent* (pp. 387-410). Exeter, United Kingdom: Pergamon.

Steinberg, L. (1996). *Beyond the classroom: Why school reform has failed and what parents need to do*. New York: Simon and Schuster.

Steinberg, L. (1997). Standards outside the classroom. In D. Ravitch, (Ed)., *The state of student performance in American schools: Brookings Papers on education policy, volume 1*. Washington, DC: Brookings Institution.

Steiny, J. (2009). A work in progress: Formative assessments shape teaching and provide mutual professional development. *Journal of Staff Development*, 30(3), 32-37.

Stringfield, S., Ross, S., & Smith, L. (1996). *Bold plans for school restructuring: The New American Schools designs.* Mahwah, NJ: Lawrence Erlbaum (1996)

Struck, J. (2003, April). *A study of talent development in a predominantly low socioeconomic and/or African American population*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Stuebing, K.K., Fletcher, J.M., LeDoux, J.M., Lyon, G.R., Shaywitz, S.E., & Shaywitz, B.A. (2002). Validity of IQ-discrepancy classifications of reading disabilities: A meta-analysis. *American Educational Research Journal, 39*, 469-518.

Swift, E. (2005). *Estimating the central office resources necessary for an adequate educational program.* Doctoral dissertation at the USC Rossier School of Education, August 2005.

Tenopir, C. (2003). Use and users of electronic media sources: An overview and analysis of recent research studies. Washington DC: Council of Library and Information.

Torgeson, J. K. (2004). Avoiding the devastating downward spiral. *American Educator*, *28*(3), 6-19, 45-47.

Vandell, D.L. (2014). Associations between Structured Activity Participation and Academic Outcomes in Middle Childhood: Narrowing the Achievement Gap? Under review at *Educational Researcher*.

Vandell, D. L., Pierce, K. M., & Dadisman, K. (2005). Out-of-school settings as a developmental context for children and youth. In R. Kail (Ed.) *Advances in Child Development and Behavior, 33*. Academic Press.

VanTassel-Baska, J., Bass, G., Ries, R., Poland, D., & Avery, L.D. (1998). A national study of science curriculum effectiveness with high ability students. *Gifted Child Quarterly*, *42*(4), 200-211.

VanTassel-Baska, J., Johnson, D.T., & Avery, L.D. (2002). Using performance tasks in the identification of economically disadvantaged and minority gifted learners: Findings from Project STAR. *Gifted Child Quarterly*, *46*, 110-123.

VanTassel-Baska, J., Johnson, D.T., Hughes, C.E., & Boyce, L.N. (1996). A study of language arts curriculum effectiveness with gifted learners. *Journal for the Education of the Gifted*, *19*, 461-480.

VanTassel-Baska, J., Zuo, L., Avery, L.D., & Little, C.A. (2002). A curriculum study of gifted student learning in the language arts. *Gifted Child Quarterly, 46*, 30-44.

Veenman, Simon. (1995). Cognitive and Noncognitive Effects of Multigrade and Multi-Age Classes: A Best Evidence Synthesis. Review of Educational Research, 65(4), 319-381.

Wasik, B., & Slavin, R.E. (1993). Preventing early reading failure with one-to-one tutoring: A review of five programs. *Reading Research Quarterly, 28*, 178-200.

Whitehurst, Grover J. "Russ," & Chingos, Matthew M. (2010). *Class size: What research says and what it means for state policy*. Washington, D.C.: The Brookings Institution.

Whitmire, Richard. (2014). *On the Rocketship*. San Francisco: Jossey-Bass.

*Word, E., Johnston, J., Bain, H., Fulton, D.B., Boyd-Zaharias, J., Lintz, M.N., Achilles, C.M., Folger, J. & Breda, C. (1990). *Student/teacher achievement ratio (STAR): Tennessee's K-3 class-size study*. Nashville, TN: Tennessee State Department of Education.

Wright, P. Sander, Horn, Sharon P., & Sanders, William L. (1997). Teacher and classroom context effects on student achievement: Implications for teacher evaluation. *Journal of Personnel Evaluation in Education, 11*(1), 57–67.

Zureich, Mike (1998). *CASBO: Staffing formula hoax*. Pleasanton, CA: Research and Development Committee, California Association of School Business Officials. #0902.

2015 WYOMING RECALIBRATION REPORT

Prepared for the
Wyoming Select Committee on School Finance Recalibration

Allan Odden
Lawrence O. Picus

PICUS ODDEN & ASSOCIATES

November 2015

Table of Contents

Chapter 1
Introduction and Overview

INTRODUCTION

Using the Evidence-Based (EB) Model, this document provides the Wyoming Legislature with a recalibration of the state's current school funding model and makes recommendations for changes needed to ensure that funding for the state's public K-12 schools remains adequate. The process of recalibrating the funding system must be done at least every five years to meet the requirements of Wyoming Statute. The work reported here builds on and extends the recalibration work Picus Odden & Associates conducted for Wyoming in 2005 and 2010.

Lawrence O. Picus and Associates (today Picus Odden & Associates) began involvement with the Wyoming recalibration cycle in 2005 when it developed a revised funding approach based on the firm's EB Model of school finance adequacy. The current funding approach uses a majority of the EB Model's recommendations, with some differences enacted by the Legislature during the 2006 and 2011 sessions of the Legislature. The legislature, in some instances, provided different levels of funding than recommended in the EB Model. In most instances, this "legislative grace" provided more resources than the EB Model, but in some instances (i.e. instructional facilitators) it provided less funding. Over time, this approach has led to discussions of the "cost-based" or "EB Model," which reflects all of our core EB recommendations, and the "Legislative Model," which reflects the decisions made by the Legislature and enacted into law. At various points in this report, we will refer to the "EB Model" or the "Legislative Model" to reflect those differences.

In 2010, Picus Odden & Associates conducted an initial desk audit and participated in the further recalibration of the Model. At the same time, the Legislature contracted for several studies to enhance the way the Model was adjusted for inflation, developing a more sophisticated external cost adjustment (ECA) process to enhance the accuracy of cost estimates of the Model's elements. The Legislature also undertook several studies to develop a better understanding of the labor market for school districts and the adequacy of school districts' salaries in Wyoming. In 2011, the Legislature also contracted for a review of the hedonic wage index (HWI), the regional cost adjustment (RCA) used in the Model, but never enacted the findings from the study, choosing instead to use the HWI developed as part of the 2005 recalibration.

This document represents the next step in the continued review of Wyoming's K-12 Funding Model.

We began the 2015 recalibration process with a more extensive desk audit of the Legislative Model's components as it was enacted and used in school year 2014-15.[1] The desk audit considered each element of the Legislative Model, reviewed current educational research related to each element and made a recommendation as to whether or not the Legislature should consider recalibrating that element. There were three reasons why we recommended an element be recalibrated:

1. Resource elements where the Legislative Model differed from the EB Model. For example, core class sizes in the EB Model are 15 in grades K-3 and 25 for grades 4 and above. In the Legislative Model core class sizes are 16 for grades K-5 and 21 in grades 6 and above. We recommended recalibration of this element so the Legislature could revisit its class size decision for the Legislative Model.

[1] Odden, A. and Picus, L.O. (2015). *Desk Audit of The Wyoming School Funding Model*. North Hollywood, CA: Picus Odden & Associates. January 15, 2015. Available at: http://legisweb.state.wy.us/LSOWeb/SchoolFinance/2015WYFundingModelDeskAudit.pdf.

2. Resource elements where the EB Model has changed. For example, the EB Model now provides each prototypical elementary school with a guidance counselor. This differs from the EB approach in 2010, and is presented as a recommendation for recalibration to ensure the Legislature has the opportunity to consider these changes.
3. Resource elements where either the context or research evidence has changed significantly in recent years. An example is technology and instructional materials, which we recommended be recalibrated because of the emergence of multiple technology-based instructional materials and textbooks that were not available in 2010.

This recalibration report uses the 2015 desk audit as its starting point and adds to the discussion of each resource element the findings from further analyses that were conducted during the recalibration process between April and October 2015. We end each resource element section with our 2015 EB recommendation.

WYOMING SCHOOL FUNDING OVER THE PAST DECADE

Table 1.1 displays operating revenues for Wyoming's public schools, on both a total and per pupil basis, for school years (SY) 2000-01 to SY 2013-14. In the ten years from 2004 to 2014, operating revenues per pupil grew from $10,629 to $17,272, an increase of $6,643 or 62%, substantially greater than inflation.

Table 1.1 also shows a notable increase in general and special fund revenues from SY 2005-06 to SY 2006-07. This jump is due largely to the 2005 recalibration, which increased funding for SY 2006-07. Operating revenues per pupil increased by $2,934 between SY 2005-06 and SY 2006-07.

The increase in the special revenue fund in SY 2010-11 and decline in the following years is primarily a result of one time federal stimulus and Education Jobs revenues provided to all states during the 2008-09 national recession. Since districts received federal funding on a reimbursement basis and the dollars were accounted for in the year expended, those revenues impacted to some extent SY 2011-12 and SY 2012-13, but were gone by SY 2012-13.

Table 1.1 shows that over the past decade the State has provided large increases in funding for its schools, particularly the funding increase resulting from the 2005 recalibration. The data also show funding has increased over the past decade by more than 62% in per pupil terms. It would be reasonable to expect a significant improvement in student performance after this notable funding gain. As shown in Chapter 2, data from the National Assessment of Education Progress (NAEP) suggest improvements in student performance have not grown at the same pace as the growth in revenues for education in Wyoming.

Table 1.1 Wyoming K-12 Operating Revenues , SY 2000-01 to SY 2013-14

School Year	General Fund	Special Revenue Fund	Enterprise Fund	Total Operating Revenue	Wyoming K-12 Enrollment	Operating Revenue per Student
2000-01	$664,657,984	$68,247,112	$21,125,317	$754,030,413	89,531	$8,422
2001-02	$717,117,803	$91,829,659	$22,781,081	$831,728,543	87,897	$9,463
2002-03	$768,273,953	$104,543,158	$22,401,472	$895,218,583	86,117	$10,395
2003-04	$759,619,272	$116,951,879	$24,154,766	$900,725,917	84,741	$10,629
2004-05	$840,452,300	$164,845,081	$25,579,975	$1,030,877,356	83,772	$12,306
2005-06	$898,107,583	$121,829,032	$26,464,070	$1,046,400,685	83,705	$12,501
2006-07	$1,115,203,988	$161,682,089	$29,363,850	$1,306,249,927	84,629	$15,435
2007-08	$1,180,793,264	$158,145,035	$31,249,986	$1,370,188,285	85,578	$16,011
2008-09	$1,193,970,428	$174,995,823	$37,904,243	$1,406,870,494	86,519	$16,261
2009-10	$1,248,998,876	$174,398,890	$38,475,854	$1,461,873,620	87,420	$16,722
2010-11	$1,274,738,890	$212,112,989	$36,257,833	$1,523,109,712	88,165	$17,276
2011-12	$1,331,844,177	$195,130,459	$37,928,804	$1,564,903,440	89,476	$17,490
2012-13	$1,370,360,483	$182,762,773	$37,539,172	$1,590,662,428	90,990	$17,482
2013-14	$1,377,783,140	$177,626,919	$37,376,032	$1,592,786,091	92,218	$17,272

Source: WDE; WDE 601 WISE Annual District Report and WDE 684 WISE TCS Fall Data

Note: Does not include 85xxx - miscellaneous revenue sources (transfers, bond issuances, sale of assets and contributed capital transfers)

Chapter 2
The School Improvement Model

The intent of the Wyoming K-12 Funding Model is to identify the costs of the State's basket of educational goods and services and then to provide each school district with adequate funds to provide that basket so each student is given an equal opportunity to meet Wyoming's student performance standards. Although a direct linkage between funding and student performance does not exist, the Wyoming K-12 Funding Model is designed to allocate adequate resources to provide all students with robust opportunities to meet college and career ready standards. Regardless of whether high school graduates go on to college or enter the workforce, today's global, knowledge-based economy requires a similar set of skills and expertise of each graduate.

No matter what course of studies a high school student completes – college prep or career tech – all of Wyoming's students are expected to achieve to college and career ready standards. This includes children from low-income homes, students of color, English language learners (ELL) and students with disabilities. The basket of educational goods and services and a cost-based funding model to support that basket must be sufficiently robust to allow students in all 48 school districts in Wyoming to attain these standards. Over the past decade, Wyoming's policy makers have provided more than sufficient funding to meet this goal and continue to work to ensure the Wyoming K-12 Funding Model meets the needs of all students.

Before presenting our desk audit of the elements in the Wyoming K-12 Funding Model, this chapter provides a description of the school improvement model that undergirds the EB Model used to estimate school finance adequacy in Wyoming. Specifically this chapter contains:

- A description of the school improvement model embedded in the EB approach to adequate school funding. The EB Model outlines how resources can be used to boost student performance, and
- A summary of NAEP scores demonstrating student achievement in Wyoming over the past 23 years – a time frame that includes student performance before the Supreme Court's first ruling in *Campbell* I.

Since 2006, the Legislative Model has consistently provided more total funding to Wyoming schools than the estimated level of adequate funding developed through the EB Model. The Legislature's intent – as we understand it – is to ensure school districts have adequate resources to improve student achievement and meet the State's student performance standards. The data in Table 1.1 shows that in its effort to ensure adequate funding for schools, the Legislature has increased operating revenues per pupil by 62% in the past decade. Unfortunately, student achievement has not risen at the same or even similar rate.

THE SCHOOL IMPROVEMENT MODEL EMBEDDED IN THE EVIDENCE-BASED APPROACH TO SCHOOL FINANCE ADEQUACY

The EB Model used to estimate a cost-based spending level for schools has been designed to allow districts and schools to provide every child with an equal opportunity to learn to State performance standards. The EB Model is unique in that it is derived from research and best practices that identify programs and strategies that boost student learning. Further, the formulas and ratios for school resources developed from that research have been reviewed by dozens of educator panels in multiple states over the past decade. The EB Model relies on two major types of research:

1. Reviews of research on the student achievement effects of each of the EB Model's individual major elements, with a focus on randomized controlled trials, the "gold standard" of evidence on "what works."
2. Studies of schools and districts that have dramatically improved student performance over a 4-6 year period – what is sometimes labeled "a doubling of student performance" on state assessments.

As a result of our research and work in other states, the EB approach is now more explicit in identifying the components of a school improvement model, and better articulates how all the elements in the EB Model are linked at the school level to strategies that when implemented produce notable improvements in student achievement (see Odden & Picus, 2014 Chapter 5).

Improving and high performing schools have clear and specific student achievement goals, including goals to reduce achievement gaps linked to poverty and minority status. The goals are nearly always specified in terms of performance on state assessments.

Compared to traditional schools where teachers work in isolated classrooms, improving schools organize instruction differently. Regardless of the context – urban, suburban or rural, rich or poor – improving and high performing schools organize teachers into collaborative teams: grade level teams in elementary schools and subject or course teams in secondary schools. With the guidance and support of instructional coaches, the teacher teams work with student data – usually short-cycle or formative assessment data – to:

- Plan standards-based curriculum units;
- Teach those units simultaneously;
- Debrief on how successful the units were; and
- Make changes when student performance does not meet expectations.

This collaborative teamwork makes instruction "public" over time by identifying a set of instructional strategies that work in the teachers' school. Over time all teachers are expected to use the instructional strategies that have been demonstrated to improve student learning and achievement.

Improving and high performing schools also provide an array of "extra help" programs for students struggling to achieve to standards. This is critical because the number of struggling students is likely to increase as more rigorous programs are implemented to prepare all students for college and careers. Individual tutoring, small group tutoring, after school academic help and summer school focused on reading and mathematics for younger students, and courses needed for high school graduation for older students, represent the array of "extra help" strategies these improving schools deploy. The idea is to "hold standards" constant and vary instructional time.

These schools exhibit dense leadership. Teachers lead by coordinating collaborative teams and through instructional coaching. Principals lead by structuring the school to foster instructional improvement. The district leads by ensuring schools have the resources to deploy the strategies outlined above with a focus on aggressive student performance goals, improving instructional practice and taking responsibility for student achievement results.

Successful and improving schools seek out top talent. They know that the challenge to prepare students for the competitive and knowledge-based global economy is difficult and requires smart and capable teachers and administrators to effectively get the educational job done.

We have continued to enhance the details of the strategy of school improvement embedded in the EB Model. We most recently summarized our findings in the fifth edition of our textbook (Odden & Picus, 2014) as well as in several books that profile schools and districts that have moved the student achievement needle (Odden & Archibald, 2009; Odden, 2009; Odden, 2012). We have also studied dramatically improving schools in Vermont and Maine as part of school finance studies we recently completed in both states. We found the theory of improvement embodied in the EB Model is reflected in nearly all these successful schools (Picus, Odden, et al., 2011; Picus, Odden, et al., 2013). In addition, other researchers and analysts have found similar features of schools that significantly improve student performance and reduce achievement gaps (Blankstein, 2010, 2011; Chenoweth, 2007, 2009).

Greg Duncan and Richard Murnane (2014) reached similar conclusions. They note that for all students to have a chance at success in the emerging global economy, they will need high quality preschool programs, followed by effective elementary and secondary schools. The key features needed in each school include: 1) leadership focused on improving instructional practice; 2) within school organization of teachers into teams that over time create a set of effective instructional practices and deploy them systematically in all classrooms; 3) a culture of assistance (e.g., instructional coaches and ongoing professional development) and accountability (e.g., adults taking responsibility for the impact of their school actions on student performance); and 4) an array of extra help strategies to extend learning time for any student who needs more time to achieve to standards.

Although the details of studies of improving and high performing schools vary, and different authors highlight somewhat different elements of the process, the overall findings are more similar than different. This suggests all schools can improve if they have adequate resources –which Wyoming schools have. The key is to deploy them effectively.

The EB Model offers a framework for the use of resources by districts and schools to help them focus those resources on programs and strategies that would allow them to produce substantial gains in student academic performance. We organize the elements of the school improvement model embedded in the EB Model into ten areas. In general, we find schools and districts that produce large gains in student performance follow ten similar strategies (see Chapter 4 and 5 of Odden & Picus, 2014; Odden, 2009), resources for each of which are included in the EB Model:

1. Analyze student data to become deeply knowledgeable about performance issues and to understand the nature of the achievement gap. The test score analysis usually first includes review of state test results and then, over time, analysis of formative/short cycle (e.g., Renaissance Learning Star Enterprise) as well as benchmark assessments (e.g., NWEA MAP) to help tailor instruction to precise student needs, to progress monitor students with an Individual Education Plan to determine whether interventions are working, and to follow the progress of students, classroom and the school over the course of the academic year. Improving schools are "performance data hungry."
2. Set higher goals such as aiming to educate at least 95% of the students in the school to proficiency or higher on state reading and math tests; seeing that a significant portion of the school's students reach advanced achievement levels; having more high school students take and pass AP classes; and making significant progress in closing the achievement gap. The goals tend to be explicit as just noted, and far beyond just producing "improvement" or "making AYP." Further, because the goals are ambitious, even when not fully attained they help the school produce large gains in student performance.
3. Review evidence on good instruction and effective curriculum. Successful schools throw out the old curriculum, replace it with a different and more rigorous curriculum, and over time create their specific view of what good instructional practice is to deliver that curriculum. Changing curriculum is a must for schools implementing more rigorous college and career ready standards.

And such new curriculum requires changes in instructional practice. Successful schools also want *all* teachers to learn and deploy new instructional strategies in their classrooms and seek to make good instructional practice systemic to the school and not idiosyncratic to each teacher's individual classroom.

4. Invest heavily in teacher training that includes intensive summer institutes and longer teacher work years, provide resources for trainers, and, most importantly, fund instructional coaches in all schools. Time is provided during the regular school day for teacher collaboration focused on improving instruction. Nearly all improving schools have found resources to fund instructional coaches to work with school-based teacher data teams, to model effective instructional practices and to observe teachers and give helpful but direct feedback. This focus has intensified now that schools are delivering a more rigorous curriculum focused on educating all students to college and career proficiency levels. And professional development is viewed as an ongoing and not a "once and done activity."
5. Provide extra help for struggling students and, with a combination of state funds and federal Title 1 funds, provide some combination of tutoring in a 1:1, 1:3, or 1:5 teacher to student format. In some cases this also includes extended days, summer school, and English language development for all ELL students. These Tier 2 interventions in the Response to Intervention (RTI) approach to helping struggling students achieve to standards are absolutely critical. For many students, one dose of even high quality instruction is not enough; many students need a combination of extra help services in order to achieve to their potential. No school producing large gains in student learning ignored these extra help strategies altogether or argued that small classes or preschool were substitutes.
6. Restructure the school day to provide more effective ways to deliver instruction. This includes multi-age classrooms in elementary schools and block schedules and double periods of mathematics and reading in secondary schools. Schools also "protect" instructional time for core subjects, especially reading and mathematics. Further, most improving schools today organize teachers into collaborative teams – grade level teams in elementary schools and subject/course teams in secondary schools. These teams meet during the regular school day, often daily, and collaboratively develop curriculum units, lesson plans to teach them, and common assessments to measure student learning results. Further, teams debrief on the impact of each collaboratively developed unit, reviewing student learning overall and across individual classrooms.
7. Provide strong leadership and support for data-based decision making and improving the instructional program, usually through the superintendent, the principal and teacher leaders. Instructional leadership is "dense" and "distributed" in successful schools; leadership derives from the teachers coordinating collaborative teacher teams, from instructional coaches, the principal and even district leaders. Both teachers and administrators provided an array of complementary instructional leadership.
8. Create professional school cultures characterized by ongoing discussion of good instruction and teachers taking responsibility for the student performance results of their actions. Over time, the collaborative teams that deliver instruction produce a school culture characterized by: 1) high expectations of performance on the part of both students and teachers, 2) a systemic and school-wide approach to effective instruction, 3) a belief that instruction is public and that good instructional practices are expected to be deployed by every individual teacher, and 4) an expectation that the adults in the school are responsible for the achievement gains (or not made) by students. Professionals in these schools accept responsibility for student achievement results.
9. Bring external professional knowledge into the school, e.g., hiring experts to provide training, adopting new research-based curricula, discussing research on good instruction, and working with regional education service agencies as well as the state department of education. Successful schools do not attain their goals by "pulling themselves up by their own boot straps." They aggressively seek outside knowledge, find similar schools that produce results and benchmark their practices, and operate in ways that typify professionals.

10. Finally, talent matters. Many improving schools today consciously seek to recruit and retain the best talent, from effective principal leaders to knowledgeable, committed and effective teachers. They seek individuals who are mission-driven to boost student learning, willing to work in a collaborative environment where all teachers are expected to acquire and deliver the school's view of effective instructional practice, and who are accountability focused.

In sum, the schools we have studied that have boosted student performance deployed strategies strongly aligned with those embedded in the EB Model. Further, in our 2008 Wyoming study of school uses of resources, we found many Wyoming educators shared this view of how schools can increase student performance. These practices bolster our claim that if funds are provided and used to implement these effective strategies, significant student performance gains should follow.

CHANGES IN WYOMING STUDENT ACHIEVEMENT: NAEP SCORES, 1990-2013

Our analysis of student performance on the NAEP suggests Wyoming student performance has improved some, but far less than the rate of increased funding. Table 2.1 displays Wyoming student performance on the NAEP between 1990 and 2013. We use NAEP data because there have been multiple changes in Wyoming's own standardized assessment over those 23 years, leaving NAEP as the only consistent measure of student performance. NAEP data are also comparable across states making analysis of student outcomes on the NAEP tests a better basis for comparison with the rest of the country. The table suggests Wyoming's students are performing better today than they did in 1990 and in 2003, although the improvement in student achievement has not grown as fast as the growth in per pupil revenues for education.

The largest gains are in mathematics. In Grade 4 math, only 19% of Wyoming's students performed at the proficient or advanced levels in 1992. That percentage more than doubled to 39% by 2003. From 2003 to 2013, the percentage of Wyoming fourth graders performing at the proficient or advanced levels rose to 48%, a 23% increase over the past decade. Grade 8 math performance also improved, but not as much. In 1992, 21% of eighth graders in Wyoming performed at the proficient or advanced levels in math. That percentage rose to 32% in 2003 and then to 38% in 2013, a 19% increase in Grade 8 math student performance over the past decade.

Gains in reading performance were not as large as those in mathematics. In 1992, 33% of Wyoming fourth graders performed at or above the proficient level. That percentage increased to 34% in 2003 and to 37% in 2013. Similarly, the percent of Wyoming Grade 8 students achieving at proficient or advanced levels in reading was 29% in 1998 (the first year for which comparable data are available), and then improved to 34% in 2003 and to 38% in 2013.

There are not sufficient data to document long-term trends in student performance in either science or writing.

Table 2.1 Summary of NAEP Results for Wyoming: 1990-2013

Assessment			Average Scale Score					Achievement Level								
			State			National		At or Above Basic			At or Above Proficient			At Advanced		
Subject	Grade	Yr.	Avg	(SE)		Avg	(SE)	%	(SE)		%	(SE)		%	(SE)	
Mathematics	4	2013	247	(0.4)	>	241	(0.2)	90	(0.7)	>	48	(0.9)	>	7	(0.5)	=
Mathematics	4	2011	244	(0.4)	>	240	(0.2)	88	(0.7)	>	44	(1.3)	>	5	(0.4)	=
Mathematics	4	2009	242	(0.6)	>	239	(0.2)	87	(0.9)	>	40	(1.2)	=	4	(0.5)	<
Mathematics	4	2007	244	(0.5)	>	239	(0.2)	88	(0.7)	>	44	(1.0)	>	5	(0.5)	=
Mathematics	4	2005	243	(0.6)	>	237	(0.2)	87	(0.9)	>	43	(1.4)	>	5	(0.7)	=
Mathematics	4	2003	241	(0.6)	>	234	(0.2)	87	(0.8)	>	39	(1.1)	>	4	(0.4)	=
Mathematics	4	2000	229	(1.1)	>	224	(1.0)	71	(2.0)	>	25	(1.4)	=	2	(0.4)	=
Mathematics	4	2000[1]	229	(1.3)	=	226	(1.0)	73	(2.0)	>	25	(1.5)	=	2	(0.5)	=
Mathematics	4	1996[1]	223	(1.4)	=	222	(1.0)	64	(1.7)	=	19	(1.2)	=	1	(0.3)	=
Mathematics	4	1992[1]	225	(0.9)	>	219	(0.8)	69	(1.4)	>	19	(1.1)	=	1	(0.3)	=
Mathematics	8	2013	288	(0.5)	>	284	(0.2)	81	(0.8)	>	38	(1.1)	>	7	(0.5)	<
Mathematics	8	2011	288	(0.6)	>	283	(0.2)	80	(1.0)	>	37	(1.2)	>	7	(0.7)	=
Mathematics	8	2009	286	(0.6)	>	282	(0.3)	78	(1.2)	>	35	(1.1)	=	7	(0.6)	=
Mathematics	8	2007	287	(0.7)	>	280	(0.3)	80	(1.1)	>	36	(1.6)	>	7	(0.7)	=
Mathematics	8	2005	282	(0.7)	>	278	(0.2)	76	(1.1)	>	29	(1.4)	=	3	(0.4)	<
Mathematics	8	2003	284	(0.7)	>	276	(0.3)	77	(1.0)	>	32	(1.0)	>	4	(0.5)	=
Mathematics	8	2000	276	(1.0)	>	272	(0.9)	69	(1.3)	>	23	(1.0)	=	3	(0.4)	=
Mathematics	8	2000[1]	277	(1.2)	=	274	(0.8)	70	(1.4)	>	25	(1.1)	=	4	(0.5)	=
Mathematics	8	1996[1]	275	(0.9)	>	271	(1.2)	68	(1.2)	>	22	(1.0)	=	2	(0.6)	=
Mathematics	8	1992[1]	275	(0.9)	>	267	(1.0)	67	(1.3)	>	21	(1.1)	=	2	(0.4)	=
Mathematics	8	1990[1]	272	(0.7)	>	262	(1.4)	64	(1.3)	>	19	(0.9)	>	2	(0.2)	=
Reading	4	2013	226	(0.6)	>	221	(0.3)	75	(1.0)	>	37	(0.9)	>	7	(0.5)	=
Reading	4	2011	224	(0.8)	>	220	(0.3)	71	(1.3)	>	34	(1.1)	=	7	(0.6)	=
Reading	4	2009	223	(0.7)	>	220	(0.3)	72	(1.1)	>	33	(1.0)	=	5	(0.6)	<
Reading	4	2007	225	(0.5)	>	220	(0.3)	73	(1.0)	>	36	(1.0)	>	8	(0.9)	=
Reading	4	2005	223	(0.7)	>	217	(0.2)	71	(1.2)	>	34	(1.4)	>	7	(0.6)	=
Reading	4	2003	222	(0.8)	>	216	(0.3)	69	(1.3)	>	34	(1.1)	>	7	(0.7)	=
Reading	4	2002	221	(1.0)	>	217	(0.5)	68	(1.4)	>	31	(1.3)	=	6	(0.5)	=
Reading	4	1998	218	(1.5)	>	213	(1.2)	64	(2.0)	>	29	(1.5)	=	6	(0.7)	=
Reading	4	1998[1]	219	(1.6)	=	215	(0.8)	65	(2.1)	=	30	(2.0)	=	6	(0.7)	=
Reading	4	1994[1]	221	(1.2)	>	212	(1.1)	68	(1.7)	>	32	(1.4)	=	6	(0.6)	=
Reading	4	1992[1]	223	(1.1)	>	215	(1.0)	71	(1.6)	>	33	(1.5)	>	5	(0.6)	=
Reading	8	2013	271	(0.6)	>	266	(0.2)	84	(0.7)	>	38	(1.0)	>	2	(0.4)	<
Reading	8	2011	270	(1.0)	>	264	(0.2)	82	(1.0)	>	38	(1.6)	>	3	(0.5)	=
Reading	8	2009	268	(1.0)	>	262	(0.3)	82	(1.4)	>	34	(1.8)	=	2	(0.5)	=
Reading	8	2007	266	(0.7)	>	261	(0.2)	80	(1.1)	>	33	(1.0)	>	2	(0.5)	=
Reading	8	2005	268	(0.7)	>	260	(0.2)	81	(1.0)	>	36	(1.4)	>	2	(0.4)	=
Reading	8	2003	267	(0.5)	>	261	(0.2)	79	(0.9)	>	34	(1.1)	>	2	(0.2)	=

Assessment			Average Scale Score					Achievement Level								
			State			National		At or Above Basic			At or Above Proficient			At Advanced		
Subject	Grade	Yr.	Avg	(SE)		Avg	(SE)	%	(SE)		%	(SE)		%	(SE)	
Reading	8	2002	265	(0.7)	>	263	(0.5)	78	(1.3)	>	31	(1.1)	=	2	(0.3)	=
Reading	8	1998	263	(1.3)	=	261	(0.8)	76	(1.8)	>	31	(1.5)	=	2	(0.5)	=
Reading	8	1998[1]	262	(1.3)	=	261	(0.8)	76	(1.4)	>	29	(1.5)	=	2	(0.4)	=
Science	4	2009	156	(0.7)	>	149	(0.3)	80	(1.0)	>	37	(1.2)	>	#	(†)	=
Science	8	2011	160	(0.5)	>	151	(0.2)	78	(0.9)	>	38	(1.1)	>	1	(0.4)	=
Science	8	2009	158	(0.7)	>	149	(0.3)	74	(1.2)	>	36	(1.3)	>	1	(0.3)	=
Writing	4	2002	150	(1.1)	=	153	(0.5)	85	(0.9)	=	23	(1.4)	<	1	(0.2)	<
Writing	8	2007	158	(1.0)	>	154	(0.3)	91	(0.9)	>	34	(1.5)	>	1	(0.3)	=
Writing	8	2002	151	(0.9)	=	152	(0.6)	86	(1.0)	=	28	(1.2)	=	1	(0.3)	<
Writing	8	1998	146	(1.4)	=	148	(0.6)	81	(1.5)	=	23	(1.7)	=	1	(0.4)	=

[1]Accommodations were not permitted for this assessment.
Rounds to zero.
† Not applicable.
Note: Standard Errors (SE) are shown in parentheses.
> Higher than National public
= Not significantly different from National public
< Lower than National public
Source: National Center for Education Statistics (NCES), NAEP, generated using the State Profiles. http://nces.ed.gov/nationsreportcard/states/

The NAEP achievement data show student performance in Wyoming has improved during the time frame in which school finance adequacy has been a major policy issue in the state. In nearly all cases, Wyoming student achievement equals or exceeds the national average. On the other hand, funding has grown at a substantially higher rate than has student performance, and in no case do at least 50% of Wyoming students achieve at proficient or advanced levels, performance levels that are critical for student opportunity in the knowledge-based global economy.

Wyoming's taxpayers, parents, legislators, educators and students will need to determine the degree to which student performance needs to improve. We would argue that the funds the Legislature has provided to its schools through the Legislative Model provide resources that could be used to boost student achievement to higher levels than have been obtained to date.

Chapter 3
Using the Evidence-Based Model to Recalibrate All Elements of the Wyoming K-12 Funding Model

INTRODUCTION

This chapter uses the EB Model to recalibrate each element of the Wyoming K-12 Funding Model. The six parts of this chapter include the following:

1. Staffing for core programs, which include full-day kindergarten, core teachers, elective/specialist teachers, minimum teachers, substitute teachers, instructional facilitators/coaches, core tutors, core guidance counselors, nurses, supervisory aides, librarians, library aides, school computer technicians, principals/assistant principals and school secretarial and clerical staff.
2. Dollar per student resources for gifted and talented, professional development, instructional materials and supplies, formative/short cycle assessments, computers and other technology, career and technical education equipment and materials and extra duty/student activities.
3. Central functions, which include maintenance and operations, central office personnel and non-personnel resources and transportation.
4. Resources for struggling students including at-risk tutors, at-risk pupil support, extended day personnel, summer school personnel, ELL personnel, alternative school personnel and special education.
5. Personnel compensation resources including salary levels, health insurance, benefits for workers' compensation, unemployment insurance, retirement and social security, regional cost adjustments.
6. Additional issues, including the ECA process and school district school finance audit process.

Each section provides an initial analysis of the current Legislative Model parameters followed by an analysis of those parameters. This analysis describes current research on the particular element, and how the current implementation of the EB Model recommends resources be allocated for the element. Each section then provides a discussion of how Wyoming school districts use the resources allocated for the particular element. Each element discussion ends with a discussion of the additional analyses conducted as part of the recalibration process and provides our 2015 EB Model recommendations.

How the Information on the Wyoming K-12 Funding Model is Organized and Presented

This section describes how we have organized the description of each element of the Wyoming K-12 Funding Model to understand the relationship and differences among:

- The 2010 EB recommendations;
- The Legislative Model, which is the actual model parameters implemented by the Legislature; and
- The 2015 EB recommendations.

We also provide for each element an estimate of the cost difference between the 2015 EB recommendations and the Legislative Model. This information is provided in table form by element to facilitate review of the many components. Following each table, we provide:

- Our initial analysis and evidence supporting the EB Model recommendations;

- An assessment of how districts in Wyoming have used the resources provided by the current Legislative Model; and
- The findings from additional analyses completed during the 2015 recalibration process.

Three Tier Approach

Before proceeding, we note that the design of the EB Model reflects the Response to Intervention (RTI) model. RTI is a three-tier approach to meeting student needs. Tier 1 refers to core instruction for all students. The EB Model seeks to make core instruction as effective as possible both with its modest class sizes, provisions for collaborative time, and robust professional development resources. Effective core instruction is the foundation on which all other educational strategies depend. Tier 2 services are provided to students struggling to achieve to standards before being given an individualized education program (IEP) and labeled as a student with a disability. The EB Model's current Tier 2 resources include one core tutor for every prototypical school and additional resources triggered by at-risk and ELL student counts providing funding for tutoring, extended day, summer school, additional pupil support and ELL services. Tier 3 includes all special education services.

Student Counts

In addition, student counts used for the formula – average daily membership (ADM) – and at-risk students need to be defined. ADM used to generate resources is the greater of the prior year or the three-year average for each school. At-risk students are defined as the unduplicated count of ELL students in grades K-12, free and reduced lunch eligible students in grades K-12, and mobile students in grades 6-12.

Prototypical Schools

A key component of the EB Model is the use of prototypical-sized schools to generate initial resource allocation strategies, followed by prorating resources to actual schools based on actual enrollments. In the Wyoming K-12 Funding Model, prototypical school sizes are used as the basis for estimating resource needs and for prorating resource generation.

In other states we have recommended prototypical schools sizes of 432 or 450 for elementary schools, 450 for middle schools and 600 for high schools. This generally derives from EB Model class size recommendations, which differ from the class sizes used in the Legislative Model in Wyoming (see Elements 3 and 4), and from larger average school sizes generally found in other states.

In Wyoming the current school size prototypes used in the Legislative Model are:

- Elementary Schools: one-section school of 96 students, two-section school of 192 student and three-section school of 288 students.
- Middle Schools: one-section school of 105 students, two-section school of 315 students and three-section school of 630 students.
- High Schools: one-section school 105 of students, two-section school of 315 students and three-section school of 630 students.

These prototypes were developed in the 2005 recalibration following a decision by the 2005 Select Committee on School Finance Recalibration to continue the class sizes of 16 at the elementary level and 21 at the secondary level used in the prior Wyoming K-12 Funding Model known as the MAP Model. With average class sizes of 16, the 288-student prototypical elementary school has 48 students at each grade level (K-5) resulting in what is typically called a three-section school – three classrooms of 16 students at each grade level. The prototypical middle school (315 students) has 105 students at each grade level (5 classes of 21 at each grade level). A prototypical high school has 630 students or is twice the size of the prototypical middle school

Because Wyoming has many small schools, these prototypical school sizes make it straightforward to recognize smaller prototype schools. These are generally proportional to the prototypes. For example, at the elementary level, 288 students represent a three-section school, a 192-student elementary school would be a two-section school and a 96-student elementary school would be a one-section school.

Table 3.1 below provides a summary of how each element is calculated under the EB recommendations from the 2010 and 2015 recalibrations, along with the current allocation in the Legislative Model. Further, estimated cost differences between the 2015 EB Model recommendations and the Legislative Model are provided.

Table 3.1 Summary of Model Elements for 2010 and 2015 Evidence-Based Model Recommendations and Legislative Model

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
STAFFING FOR CORE PROGRAMS				
1. Full-Day Kindergarten	Full-day kindergarten provided.	Full-day kindergarten provided. At least one school in each district must have a full-day kindergarten program.	Full-day kindergarten provided.	$0
2. Elementary Core Teachers/ Class Size	Grades K-3: 15; Grades 4-5/6: 25. Average class size of 17.3 (K-5) or 18.3 (K-6).	Grades K-5/6: 16. Average class size of 16 (K-5/6).	Grades K-3: 15; Grades 4-5/6: 25. Average class size of 17.3 (K-5) or 18.3 (K-6).	-218.44 FTEs, ($16,911,902)
3. Secondary Core Teachers/ Class Size	Grades 6-12: 25.	Grades 6-12: 21.	Grades 6-12: 25.	Middle school: -133.10 FTEs, ($10,305,284) High school: -139.19 FTEs, ($10,803,036)
4. Elective/ Specialist Teachers	<u>Elementary Schools</u>: 20% of core elementary school teachers.	<u>Elementary Schools</u>: 20% of core elementary school teachers.	<u>Elementary Schools</u>: 20% of core elementary school teachers.	-43.69 FTEs, ($3,382,380) *Note: Due to smaller Legislative Model class sizes.*
	<u>Middle Schools</u>: 20% of core middle school teachers.	<u>Middle Schools</u>: 33% of core middle school teachers.	<u>Middle Schools</u>: 20% of core middle school teachers.	-142.07 FTEs, ($11,010,016) *Note: Due to elective teacher percentage and smaller class sizes in the Legislative Model.*
	<u>High Schools</u>: 33 1/3% of core high school teachers.	<u>High Schools</u>: 33% of core high school teachers.	<u>High Schools</u>: 33 1/3% of core high school teachers.	-42.58 FTEs, ($3,304,380) *Note: Due to elective teacher percentage and smaller class sizes in the Legislative Model.*

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
5. Additional CTE Teachers	No additional vocational education teachers resourced.	Apply an additional weighting factor of 29% to vocational education (CTE) student FTEs. Based upon weighted student count, provide an additional teacher for every 21 students.	No additional vocational education teachers resourced.	-37.56 FTEs, ($2,919,741)
6. Minimum Teachers and Staff Resources	*Minimum Teachers* Elementary Schools: a minimum of 3.65 teachers provided for elementary schools with ADM greater than 49. Middle Schools: a minimum of 7.0 teachers provided for middle schools with ADM greater than 49. High Schools: a minimum of 7.0 teachers provided for high schools with ADM greater than 49. Minimum teachers are resourced at the highest grade band level.	*Minimum Teachers* Elementary Schools: a minimum of 6.0 teachers provided for elementary school grade bands with ADM greater than 49. Middle Schools: a minimum of 8.0 teachers provided for middle school grade bands with ADM greater than 49. High Schools: a minimum of 10.0 teachers provided for high school grade bands with ADM greater than 49. For school grade bands of 49 and below, minimum teacher resources are provided on a prorated basis at 1.0 teacher for every 7 students with a minimum of 1.0 teacher. Additionally, there is a “Small District Adjustment,” which provides districts with 243 or fewer ADM a minimum of one teacher at each school for every grade level ADM exists. *Minimum Staff (Small School Adjustment)*	*Minimum Teachers* Elementary Schools: a minimum of 7.0 teachers provided for elementary school grade bands with ADM greater than 49. Middle Schools: a minimum of 7.0 teachers provided for middle school grade bands with ADM greater than 49. High Schools: a minimum of 7.0 teachers provided for high school grade bands with ADM greater than 49. For school grade bands of 49 & below, minimum teacher resources are provided on a prorated basis at 1 teacher for every 7 students, with a minimum of 1.0 teacher position. *Non-Teacher Staff Resources* For schools with ADM less than the highest grade band’s one-section school (96 elementary, 105 middle and high school) 1.0 assistant principal position is provided and other non-teacher	*Minimum Teachers:* -34.64 FTEs, ($2,686,814) *Small District Teachers:* -15.99 FTEs, ($1,236,104) *Non-Teacher Staff Resources:* 40 Assistant Principal FTEs, $3,907,761

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
		For elementary, middle and high schools of 49 ADM & below, minimum staff resources are provided on the basis 1.0 assistant principal and 1.0 teacher for every 7.0 ADM, with a minimum of 1.0 teacher.	staff elements are resourced based on total school ADM at the highest grade band and prorated down from a one-section school for all schools, where identified. Additionally, resources generated by the at-risk and ELL student counts are provided for all schools.	
7. Instructional Facilitators/ Coaches	Provide 1.5 instructional facilitator/coaches for prototypical elementary (288 ADM) and secondary (315 ADM) schools at the highest grade band level. Fund as a categorical grant.	Resourced equal to 60% of the 2010 Evidence-Based recommendation. Funded as a categorical grant.	Provide 1.5 instructional facilitator/coaches for prototypical elementary (288 ADM) and secondary (315 ADM) schools at the highest grade band level, with a minimum of 1.0 FTE for each school districts. Fund as a categorical grant.	193.78 FTEs, $15,030,357
8. Core Tutors/ Tier 2 Intervention	Provide a minimum of 1.0 tutor position for each prototypical school, resourced at the highest grade band level, <u>*less*</u> tutor positions provided on basis of at-risk student count (1.0 tutor position for every 100 at-risk students).	Provide a minimum of 1.0 tutor position for each prototypical school, resourced at the highest grade band level, <u>*less*</u> tutor positions provided on basis of at-risk student count (1.0 tutor position for every 100 at-risk students).	Provide 1.0 tutor position for each prototypical school (288 ADM elementary school and 315 ADM middle or high school), resourced at the highest grade-band level.	Total: 288.64 Core Tutor FTEs, $22,389,965 *Note: Net increase in total tutors of 225.28 FTEs, $17,476,819 when accounting for both Core (Element 8) and At-Risk tutors (Element 26).*
9. Substitute Teachers	Provide for 5% (8.75 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches and teacher positions for summer school and extended day. Resourced at a daily salary equal to $99.25 (inflated to $102.97)	Provide for 5% (8.75 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches and teacher positions for summer school and extended day. Resourced at a daily salary equal to $102.97 plus 7.65% for social	Provide for 5.715% (10 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches and teacher positions for summer school and extended day. Resourced at a daily salary equal to $102.97 plus 7.65% for social	Total: $918,511 *Note: Since this component is variable based on the number of teachers, tutors, IFs, summer school and extended-day teachers,*

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	plus 7.65% for social security and Medicare benefits ($110.85). Substitute resources provided for small schools.	security and Medicare benefits ($110.85). Substitute resources provided for small schools.	security and Medicare benefits ($110.85). Daily salary adjusted by regional cost adjustment.	*the estimated cost difference will fluctuate if any of those components are changed.*
10. Core Pupil Support Staff, Core Guidance Counselors and Nurses	Core Pupil Support Staff: A minimum of 1.0 pupil support staff position is provided for each prototypical school, resourced at the highest grade band level, *less* pupil support staff positions provided on basis of at-risk student count (1.0 pupil support staff position for every 100 at-risk students).	Core Pupil Support Staff: A minimum of 1.0 pupil support staff position is provided for each prototypical school, resourced at the highest grade band level, *less* pupil support staff positions provided on basis of at-risk student count (1.0 pupil support staff position for every 100 at-risk students).	Core Pupil Support Staff: Only provided on the basis of at-risk student counts.	-21.01 FTEs, ($1,627,403) *Note: Net decrease in total pupil support of 84.37 FTEs, $6,540,549 when accounting for both Core (Element 10) and At-Risk pupil support (Element 27).*
	Core Guidance Counselors: Provide 1.0 guidance counselor position for every 250 middle and high school students.	Core Guidance Counselors: Provide 1.0 guidance counselor position for every 250 middle and high school students.	Core Guidance Counselors: Provide 1.0 guidance counselor position for each prototypical elementary school (288 ADM) and 1.0 guidance counselor position for every 250 middle and high school ADM.	175.64 FTEs, $13,619,983
	Nurses: No nurses resourced directly, but can utilize minimum pupil support resources as nurse positions.	Nurses: No nurses resourced directly, but can utilize minimum pupil support resources as nurse positions.	Nurses: Provide 1.0 nurse position for every 750 ADM.	124.14 FTEs, $9,628,251
11. Supervisory and Instructional Aides	Provide funding at an amount equal to 2.0 supervisory aide positions for each prototypical elementary school (288 ADM); 2.0 supervisory aide positions for each prototypical middle school (315 ADM); 5.0 supervisory aide positions each prototypical high school (630 ADM); resourced at	Provide funding at an amount equal to 2.0 supervisory aide positions for each prototypical elementary school (288 ADM); 2.0 supervisory aide positions for each prototypical middle school (315 ADM); 5.0 supervisory aide positions each prototypical high school (630 ADM); resourced at	Provide funding at an amount equal to 2.0 supervisory aide positions for each prototypical elementary school (288 ADM); 2.0 supervisory aide positions for each prototypical middle school (315 ADM); 3.0 supervisory aide positions each prototypical high school (630 ADM); resourced at	-68.52 FTEs, ($2,639,473)

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	the highest-grade prototype using total school ADM.	the highest-grade prototype using total school ADM.	the highest-grade prototype using total school ADM.	
12. Librarians and Librarian Media Technicians	Fund at the district level rather than school level. For districts with 0-300 ADM, provide funding for 1 librarian and 1 library clerk. For districts with 301-630 ADM, prorate from the 300 ADM level up to 2 librarians, but retain the 1 librarian clerk for the 630 ADM. Above 630 ADM, 1 librarian for every 288 elementary ADM and 1 librarian and 2 library clerks for every 630 secondary ADM, with a minimum of 2 librarians and 1 library clerk. No library media technicians funded, but rather a separate computer technician position in central office.	*Librarian Positions:* Provide 1.0 librarian position for prototypical elementary schools (288 ADM) prorate up and down, below and above 288 ADM. For middle or high schools with ADM between 105 and 630 ADM, 1.0 librarian position. Below 105 ADM prorate down and above 630 ADM prorate up. *Library Media/Computer Technician Position:* Provide 1.0 library media/computer technician position for every 315 middle and high school ADM, prorated up and down.	*Librarian Positions:* For elementary schools, provide librarian resources at the following levels: for elementary schools with ADM less than 96 ADM, prorate a 0.50 librarian position down; for elementary schools with ADM between 96 and 143, provide a 0.50 librarian position; for elementary schools with ADM between 143 and 288, provide a 1.0 librarian position prorated down to 143 ADM. For middle and high schools, provide librarian resources at the following levels: for middle and high schools with ADM less than 105 ADM, prorate a 0.50 librarian position down; for middle and high schools with ADM between 105 and 157.5, provide a 0.50 librarian position; for middle and high schools with ADM between 157.5 and 315, provide a 1.0 librarian position prorated down to 157.5 ADM. For all school districts, provide a minimum of 1.0 librarian position. *Library Aide Positions:* For elementary schools, provide library aide resources at the following levels: for elementary schools with ADM greater than	-44.06 FTEs Librarian FTEs, ($3,406,728) 72.97 Library Aide FTEs, $2,805,139

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
			288, prorate a 1.0 library aide position between 288 and 576 ADM; for elementary schools with more than 576 ADM, provide an additional library aide position for every 630 ADM. For middle and high schools, prorate up 1.0 library aide from 315 to 630 ADM; above 630 ADM prorate up 1.0 library aide for every additional 630 ADM. *<u>School Computer Technician Position:</u>* Provide 1.0 school computer technician position for every 630 elementary, middle and high school ADM, prorated up and down, with a minimum of a 0.5 position for each district.	12.16 Computer Technician FTEs, $893,000 **Net Total for library all staff: 41.07 FTEs, $291,411.**
13. Principals and Assistant Principals	Provide 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, prorated by ADM below 105 ADM down to 49 ADM. Provide 1.0 assistant principal position for every 288 elementary ADM beginning at 289 ADM;1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM. Resourced at the highest grade band level.	Provide 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, prorated by ADM below 105 ADM down to 49 ADM. Provide 1.0 assistant principal position for every 288 elementary ADM beginning at 289 ADM;1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM. Resourced at the highest grade band level.	Provide 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools. Provide 1.0 assistant principal position for every 288 elementary ADM beginning at 289 ADM and for elementary schools below 96 ADM; 1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM and for middle and high schools below 105 ADM Resourced at the highest grade	Principals: -14.60 FTEs, ($1,624,207) Assistant Principals: 22.00 FTEs, $2,101,900 *Note: net all assistant principal FTEs for alternative schools (Element 31 and schools below the smallest school prototype).*

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
			band level.	
14. School Site Secretarial and Clerical Staff	Secretarial Staff: Provide 1.0 secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels. Provide an additional 1.0 secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle and high school ADM starting at 315 ADM. Clerical Staff: Provide 1.0 clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM. Provide 4.0 clerical positions for every 630 high school ADM, prorated above and below 630 ADM. All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	Secretarial Staff: Provide 1.0 secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels. Provide an additional 1.0 secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle and high school ADM starting at 315 ADM. Clerical Staff: Provide 1.0 clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM. Provide 4.0 clerical positions for every 630 high school ADM, prorated above and below 630 ADM. All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	Secretarial Staff: Provide 1.0 secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels. Provide an additional 1.0 secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle and high school ADM starting at 315 ADM. Clerical Staff: Provide 1.0 clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM. Provide 2.0 clerical positions for every 630 high school ADM, prorated above and below 630 ADM. All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	19.25 Secretarial FTEs, $1,080,358 -73.60 Clerical FTEs, ($3,433,618)

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
DOLLAR PER STUDENT RESOURCES				
15. Gifted and Talented Students	Provide an amount equal to $29.19 per ADM, inflated annually to $31.60.	Provide an amount equal to $30.27 per ADM.	Provide an amount equal to $40.00 per ADM.	$905,832
16. Intensive Professional Development	Provide 10 days of student free time for training in salary levels; $116.76 per ADM for trainers, inflated annually to $126.40.	Provide 10 days of student free time for training in salary levels; $121.08 per ADM for trainers.	Provide 10 days of student free time for training in salary levels; $125.00 per ADM for trainers.	$364,744
17. Instructional Materials	Provide $140.00 per ADM for elementary and middle schools and $175.00 per ADM for high schools, inflated annually to $152.44 for elementary and middle school and $190.55 for high schools.	Provide $345.77 per ADM for elementary and middle schools and $423.38 per ADM for high schools.	Provide $190.00 per ADM for elementary, middle and high schools.	($16,456,680)
18. Short Cycle/ Formative Assessments	Provide $37.70 per ADM and not subject to an ECA.	Provide $37.70 per ADM and not subject to an ECA.	Provide $25.00 per ADM and not subject to an ECA.	($1,182,000)
19. Technology and Equipment	Provide an amount equal to $250.00 per ADM, inflated annually to $272.22.	Provide an amount equal to $302.71 per ADM.	Provide an amount equal to $250.00 per ADM and not subject to an ECA.	($4,907,038)
20. CTE Equipment/ Materials	Provide an amount equal to $9,027.27 per vocational education teacher FTE ($1,739.70 for equipment allowance; $6,418.39 for supply allowance; $869.18 for replacement allowance) inflated annually to $9,829.59.	Provide an amount equal to $9,361.46 per vocational education teacher FTE ($1,804.10 for equipment allowance; $6,655.99 for supply allowance; $901.36 for replacement allowance).	Provide an amount equal to $9,361.46 per vocational education teacher FTE.	$0
21. Extra Duty Funds/Student Activities	Provide an amount equal to $288.98 per ADM, inflated annually to $314.66.	Funded at grade-band level, by school. For grades K-5, provide an amount equal to $24.94 per student. For grades 6-12, use inverse sliding scales based on student enrollment for grades 6-8 and grades 9-12. Grades 6-8	Provide a total level of funding equal to $314.66 per ADM, but utilize a per ADM amount for elementary schools and sliding scale amounts for middle and high schools, at reduced levels. For elementary grades, provide an	($2,762,078)

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
		school funding levels range from \$820.30 for 1 ADM and \$211.94 per ADM for a school of 1,260 ADM. Grades 9-12 funding levels range from \$2,114.58 for 1 ADM and \$623.33 per ADM for a school of 1,260 ADM. Alternative schools receive an amount equal to \$299.68 per ADM.	amount equal to \$23.62 per ADM. For middle and high schools, use inverse sliding scales based on ADM. Middle school funding levels range from \$776.95 for 1 ADM and \$200.74 per ADM for a school of 1,260 ADM. High school funding levels range from \$2,002.82 for 1 ADM and \$590.39 per ADM for a school of 1,260 ADM. For alternative schools, fund as any other school. Sixth grade elementary students funded using the elementary per ADM amount and ninth grade students included in the high school ADM for the schools they would attend.	
CENTRAL OFFICE FUNCTIONS				
22. Operations and Maintenance	<u>Custodian Positions</u>: Calculated on the basis of four factors: 1) number of model generated teachers; 2) school ADM; 3) number of classrooms as reported by the School Facilities Department (SFD); and 4) the lesser of actual educational gross square footage (GSF) or SFD allowable educational GSF adjusted up by 115%. These four factors are added together and divided by four to arrive at the preliminary FTE. The factor for each of these components is derived by finding the ratio of a	<u>Custodian Positions</u>: Calculated on the basis of four factors: 1) number of model generated teachers; 2) school ADM; 3) number of classrooms as reported by the School Facilities Department (SFD); and 4) the lesser of actual educational gross square footage (GSF) or SFD allowable educational GSF adjusted up by 115%. These four factors are added together and divided by four to arrive at the preliminary FTE. The factor for each of these components is derived by finding the ratio of a	<u>Custodian Positions</u>: Calculated on the basis of four factors: 1) number of model generated teachers; 2) school ADM; 3) number of classrooms as reported by the School Facilities Department (SFD); and 4) the lesser of actual educational gross square footage (GSF) or SFD allowable educational GSF adjusted up by 115%. These four factors are added together and divided by four to arrive at the preliminary FTE. The factor for each of these components is derived by finding the ratio of a	-17.81 FTEs, (\$921,751) *Note: Differences are due to class sizes which generate teachers, which are then used in the custodial formulae.*

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	school's actual data to adequacy standards reported by Zureich (13 teachers standard; 325 ADM standard; 13 classrooms standard; 18,000 GSF standard). This base FTE is further adjusted by an additional 0.5 FTE for secondary schools. Small schools do not generate custodial FTE positions. Custodian FTEs for non-educational buildings are based solely on the GSF factor, which is limited to 10% of a district's total allowable educational GSF divided by the Zureich factor (18,000 GSF). Maintenance Worker Positions: Calculated on the basis of four factors: 1) building; 2) the lesser of actual educational GSF or SFD allowable educational GSF adjusted up by 115%; 3) school ADM; and 4) FY 2006 GF operating expenditures. These four FTE factors are added together and divided by four to arrive at a base FTE. The factor for each of these components is derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich: 1.10 building factor; 60,000 GSF standard and a 1.20 factor; 1,000 ADM standard and 1.30 factor; $5 million standard and 1.20 factor). The	school's actual data to adequacy standards reported by Zureich (13 teachers standard; 325 ADM standard; 13 classrooms standard; 18,000 GSF standard). This base FTE is further adjusted by an additional 0.5 FTE for secondary schools. Small schools do not generate custodial FTE positions. Custodian FTEs for non-educational buildings are based solely on the GSF factor, which is limited to 10% of a district's total allowable educational GSF divided by the Zureich factor (18,000 GSF). Maintenance Worker Positions: Calculated on the basis of four factors: 1) building; 2) the lesser of actual educational GSF or SFD allowable educational GSF adjusted up by 115%; 3) school ADM; and 4) FY 2006 GF operating expenditures. These four FTE factors are added together and divided by four to arrive at a base FTE. The factor for each of these components is derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich: 1.10 building factor; 60,000 GSF standard and a 1.20 factor; 1,000 ADM standard and 1.30 factor; $5 million standard and 1.20 factor). The	school's actual data to adequacy standards reported by Zureich (13 teachers standard; 325 ADM standard; 13 classrooms standard; 18,000 GSF standard). This base FTE is further adjusted by an additional 0.5 FTE for secondary schools. Small schools do not generate custodial FTE positions. Custodian FTEs for non-educational buildings are based solely on the GSF factor, which is limited to 10% of a district's total allowable educational GSF divided by the Zureich factor (18,000 GSF). Maintenance Worker Positions: Calculated on the basis of four factors: 1) building; 2) the lesser of actual educational GSF or SFD allowable educational GSF adjusted up by 115%; 3) school ADM; and 4) FY 2006 GF operating expenditures. These four FTE factors are added together and divided by four to arrive at a base FTE. The factor for each of these components is derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich: 1.10 building factor; 60,000 GSF standard and a 1.20 factor; 1,000 ADM standard and 1.30 factor; $5 million standard and 1.20 factor). The	 -3.32 Maintenance Worker FTEs, ($197,126)

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	base number is further adjusted for 1) school level (base FTE is multiplied by 0.80 for elementary schools, 1.0 for middle schools, and 2.0 for high schools); 2) building age where schools under 10 years old are multiplied by a factor of 0.95 and over 30 years old by a factor of 1.10; and 3) small district size where FTE are multiplied by a factor of 1.10 for under 1,000 ADM. It is assumed that the maintenance worker FTEs determined on the basis of a district's total allowable educational GSF for schools are sufficient to service all buildings in a district, both educational and non-educational. Groundskeeper Positions: Determined at the site rather than building/program level. The number of FTEs for all sites, both educational and non-educational, is based on the number of acres of the site and the standard for the number of annual work hours per acre (93 hours). The FTE calculation assumes a 2,008 hour work year for groundskeepers. The initial FTE is adjusted for the primary school level or use of the site, with non-educational and elementary school sites received no additional adjustment, middle	base number is further adjusted for 1) school level (base FTE is multiplied by 0.80 for elementary schools, 1.0 for middle schools, and 2.0 for high schools); 2) building age where schools under 10 years old are multiplied by a factor of 0.95 and over 30 years old by a factor of 1.10; and 3) small district size where FTE are multiplied by a factor of 1.10 for under 1,000 ADM. It is assumed that the maintenance worker FTEs determined on the basis of a district's total allowable educational GSF for schools are sufficient to service all buildings in a district, both educational and non-educational. Groundskeeper Positions: Determined at the site rather than building/program level. The number of FTEs for all sites, both educational and non-educational, is based on the number of acres of the site and the standard for the number of annual work hours per acre (93 hours). The FTE calculation assumes a 2,008 hour work year for groundskeepers. The initial FTE is adjusted for the primary school level or use of the site, with non-educational and elementary school sites received no additional adjustment, middle	base number is further adjusted for 1) school level (base FTE is multiplied by 0.80 for elementary schools, 1.0 for middle schools, and 2.0 for high schools); 2) building age where schools under 10 years old are multiplied by a factor of 0.95 and over 30 years old by a factor of 1.10; and 3) small district size where FTE are multiplied by a factor of 1.10 for under 1,000 ADM. It is assumed that the maintenance worker FTEs determined on the basis of a district's total allowable educational GSF for schools are sufficient to service all buildings in a district, both educational and non-educational. Groundskeeper Positions: Determined at the site rather than building/program level. The number of FTEs for all sites, both educational and non-educational, is based on the number of acres of the site and the standard for the number of annual work hours per acre (93 hours). The FTE calculation assumes a 2,008 hour work year for groundskeepers. The initial FTE is adjusted for the primary school level or use of the site, with non-educational and elementary school sites received no additional adjustment, middle	

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	school sites receiving an adjustment factor of 1.5 and high school sites an adjustment factor of 2.5. Groundskeeper FTE calculations for acreage acquired by a district after July 1, 1997, are based upon the lesser of the actual site acreage on which the facility is situated or the SFD/SFC guidelines: elementary schools (four acres plus one acre for every 100 ADM); middle schools (10 acres plus one acre for every 100 ADM; high schools (20 acres plus one acre for every 100 ADM). In instances where districts acquired acreage after July 1, 1997 through an exchange of land with another government entity, and the acreages involved in the exchange were originally acquired by the district and the government entity on or before July 1, 1997, the acreage is not subject to the SFC guidelines. The entire acreage will be used in the calculation of groundskeeper FTEs. If a district has acquired a site after July 1, 1997, and the site is without a facility situated on it or has a facility under construction, groundskeeper FTEs will not be generated for the acreage. <u>Supplies and Materials</u>: Funding for O&M supplies is	school sites receiving an adjustment factor of 1.5 and high school sites an adjustment factor of 2.5. Groundskeeper FTE calculations for acreage acquired by a district after July 1, 1997, are based upon the lesser of the actual site acreage on which the facility is situated or the SFD/SFC guidelines: elementary schools (four acres plus one acre for every 100 ADM); middle schools (10 acres plus one acre for every 100 ADM; high schools (20 acres plus one acre for every 100 ADM). In instances where districts acquired acreage after July 1, 1997 through an exchange of land with another government entity, and the acreages involved in the exchange were originally acquired by the district and the government entity on or before July 1, 1997, the acreage is not subject to the SFC guidelines. The entire acreage will be used in the calculation of groundskeeper FTEs. If a district has acquired a site after July 1, 1997, and the site is without a facility situated on it or has a facility under construction, groundskeeper FTEs will not be generated for the acreage. <u>Supplies and Materials</u>: Funding for O&M supplies is	school sites receiving an adjustment factor of 1.5 and high school sites an adjustment factor of 2.5. Groundskeeper FTE calculations for acreage acquired by a district after July 1, 1997, are based upon the lesser of the actual site acreage on which the facility is situated or the SFD/SFC guidelines: elementary schools (four acres plus one acre for every 100 ADM); middle schools (10 acres plus one acre for every 100 ADM; high schools (20 acres plus one acre for every 100 ADM). In instances where districts acquired acreage after July 1, 1997 through an exchange of land with another government entity, and the acreages involved in the exchange were originally acquired by the district and the government entity on or before July 1, 1997, the acreage is not subject to the SFC guidelines. The entire acreage will be used in the calculation of groundskeeper FTEs. If a district has acquired a site after July 1, 1997, and the site is without a facility situated on it or has a facility under construction, groundskeeper FTEs will not be generated for the acreage. <u>Supplies and Materials</u>: Funding for O&M supplies is	

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	calculated at a rate of $0.64 per GSF for both educational and non-educational space, inflated annually to $0.70. For educational space, GSF is equal to the lesser of actual educational GSF or allowable educational GSF adjusted up by 115%. Funding for non-educational space is equal to 10% of a district's total allowable educational GSF. Utilities: Funding for utilities is based on actual FY 2009-10 district expenditures as reported by the WDE (expenditure functions 3410-3450 & 3490 Only; Objects 451-459 plus communications - object 340, excluding special education functions 1210 & 2230 and student transportation functions 3510 & 3520) inflated annually. For additional school buildings added (not replacement schools) to a school district's building inventory after school year 2009-10, multiply the average GSF cost as adjusted by the ECA by the total GSF (lesser of actual or SFD allowable) for the new buildings to provide additional utility resources for the new GSF.	calculated at a rate of $0.67 per GSF for both educational and non-educational space. For educational space, GSF is equal to the lesser of actual educational GSF or allowable educational GSF adjusted up by 115%. Funding for non-educational space is equal to 10% of a district's total allowable educational GSF. Utilities: Funding for utilities is based on actual FY 2009-10 district expenditures as reported by the WDE (expenditure functions 3410-3450 & 3490 Only; Objects 451-459 plus communications - object 340, excluding special education functions 1210 & 2230 and student transportation functions 3510 & 3520) as adjusted by the ECA enacted by the Legislature. For additional school buildings added (not replacement schools) to a school district's building inventory after school year 2009-10, multiply the average GSF cost as adjusted by the ECA by the total GSF (lesser of actual or SFD allowable) for the new buildings to provide additional utility resources for the new GSF.	calculated at a rate of $0.67 per GSF for both educational and non-educational space. For educational space, GSF is equal to the lesser of actual educational GSF or allowable educational GSF adjusted up by 115%. Funding for non-educational space is equal to 10% of a district's total allowable educational GSF. Utilities: Funding for utilities is based on actual FY 2009-10 district expenditures as reported by the WDE (expenditure functions 3410-3450 & 3490 Only; Objects 451-459 plus communications - object 340, excluding special education functions 1210 & 2230 and student transportation functions 3510 & 3520) as adjusted by the ECA enacted by the Legislature. For additional school buildings added (not replacement schools) to a school district's building inventory after school year 2009-10, multiply the average GSF cost as adjusted by the ECA by the total GSF (lesser of actual or SFD allowable) for the new buildings to provide additional utility resources for the new GSF.	

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
23. Central Office Personnel/ Non-Personnel Resources	Central Office Personnel: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions. 1,000 ADM: 4.0 administrative and 4.0 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM. 3,500 ADM: 7.0 administrative and 9.0 classified positions. Position counts prorated down linearly between 3,500 to 1,000 ADM. Position counts prorated up linearly above 3,500 ADM. Non-Personnel Resources: Provide an amount equal to $350.28 per ADM for non-personnel resources, inflated annually to $381.41.	Central Office Personnel: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions. 1,000 ADM: 4.0 administrative and 4.0 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM. 3,500 ADM: 8.0 administrative and 10.0 classified positions. Position counts prorated down linearly between 3,500 to 1,000 ADM. Position counts prorated up linearly above 3,500 ADM. Non-Personnel Resources: Provide an amount equal to $363.25 per ADM for non-personnel resources.	Central Office Personnel: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions. 1,000 ADM: 4.0 administrative and 6.5 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM. 2,000 ADM: 5.5 administrative and 9.0 classified positions. Position counts prorated down linearly between 2,000 to 1,000 ADM. 4,000 ADM: 8.0 administrative and 16.0 classified positions. Position counts prorated down linearly between 4,000 to 2,000 ADM. 12,000 ADM: 24.0 administrative and 39.0 classified positions. Position counts prorated down linearly from 12,000 to 4,000 ADM. Position counts prorated up linearly above 12,000 ADM. Non-Personnel Resources: Provide an amount equal to $363.25 per ADM for non-personnel resources.	Administrative Personnel: -15.73 FTEs, ($2,383,253) Classified Personnel: 92.42 FTEs, $5,489,732 Net Total: 76.69 FTEs, $3,106,478

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
24. Transportation	Reimburse 100% of the allowable expenditures.	Reimburse 100% of the allowable expenditures.	Reimburse 100% of the allowable expenditures.	$0
25. Food Service Programs	Not part of the Evidence-Based Model. Assumed to be self-supporting.	Not part of the Legislative Model. Assumed to be self-supporting.	Not part of the Evidence-Based Model. Assumed to be self-supporting.	$0
RESOURCES FOR STRUGGLING STUDENTS				
26. At-Risk Tutors	Provide 1.0 tutor position for every 100 at-risk students. Not provided for small or alternative schools.	Provide 1.0 tutor position for every 100 at-risk students. Not provided for small or alternative schools.	Provide 1.0 tutor position for every 125 at-risk students.	-63.36 At-Risk Tutor FTEs, ($4,913,146) *Note: Net increase in total tutors of 225.28 FTEs, $17,476,819 when accounting for both Core (Element 8) and At-Risk tutors (Element 26).*
27. At-Risk Pupil Support Staff	Provide 1.0 at-risk pupil support position for every 100 at-risk students. Not provided for small or alternative.	Provide 1.0 at-risk pupil support position for every 100 at-risk students. Not provided for small or alternative.	Provide 1.0 at-risk pupil support position for every 125 at-risk students.	-63.36 FTEs, ($4,913,146) *Note: Net decrease in total pupil support of 84.37 FTEs, $6,540,549 when accounting for both Core (Element 10) and At-Risk pupil support (Element 27).*
28. Extended Day Program Funding	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.	For both extended-day and summer school programs, funding is provided outside of block grant and as a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students. Not provided for small or alternative schools. A minimum 0.50 FTE is provided for school	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.	241.98 FTEs, $18,777,847

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
		districts that do not generate that amount based upon the district's at-risk count.		
29. Summer School Funding	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.	For both extended-day and summer school programs, funding is provided outside of block grant and as a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students. Not provided for small or alternative schools. A minimum 0.50 FTE is provided for school districts that do not generate that amount based upon the district's at-risk count.	Provide 1.0 at-risk position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.	203.79 FTEs, $15,815,521 (net minimum of 0.50 FTE provided by Legislative Model)
30. English Language Learner (ELL) Students	Provide 1.0 ELL teacher position for every 100 ELL students. Not provided for small or alternative schools.	Provide 1.0 ELL teacher position for every 100 ELL students. Not provided for small or alternative schools.	Provide 1.0 ELL teacher position for every 100 ELL students.	0.39 FTEs, ($30,451)
31. Alternative Schools	No separate formula. Fund as any other school.	Provide funding for all staff at a ratio of 1.0 assistant principal and 1.0 teacher position for every 7 ADM.	No separate formula. Fund as any other school.	-135.37 FTE Teachers ($10,488,692) and 18.00 Assistant Principals ($1,807,754). *Note: Teacher and Assistant Principals and netted out in other resources.*
32. Special Education	N/A	100% reimbursement of approved expenditures	100% reimbursement of approved expenditures	$0

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
PERSONNEL COMPENSATION RESOURCES				
33. Salary Levels	Superintendent: Base salary $77,260; Bachelor’s premium $18,613; Master’s premium $24,654; Doctorate’s premium $29,678; State experience per year premium $208; District per ADM premium $4.13. Assistant Superintendent: 80% of Superintendent. Business Manager: Base salary $42,446; Bachelor’s premium $18,613; Master’s premium $24,654; Doctorate’s premium $29,678; State experience per year premium $208; District per ADM premium $4.13. Principal: Base salary $71,645; Doctorate’s premium $8,282; State experience per year premium $622; School per ADM premium $14.15. Assistant Principal: Base salary $60,459; Doctorate’s premium $8,282; State experience per year premium $622; School per ADM premium $14.15. Teacher: Base salary $37,017; Master’s premium $6,164; Doctorate’s premium $13,449; Experience per year premium for	Superintendent: Base salary $80,155; Bachelor’s premium $19,311; Master’s premium $25,578; Doctorate’s premium $30,791; State experience per year premium $215; District per ADM premium $4.29. Assistant Superintendent: 80% of Superintendent. Business Manager: Base salary $44,037; Bachelor’s premium $19,311; Master’s premium $25,578; Doctorate’s premium $30,791; State experience per year premium $215; District per ADM premium $4.29. Principal: Base salary $74,330; Doctorate’s premium $8,593; State experience per year premium $645; School per ADM premium $14.68. Assistant Principal: Base salary $60,459; Doctorate’s premium $8,593; State experience per year premium $645; School per ADM premium $14.68. Teacher: Base salary $38,404; Master’s premium $6,395; Doctorate’s premium $13,953; Experience per year premium for	Accept Legislative Model salaries as cost-based and used in the 2015 EB Model. Additionally, continue the labor market monitoring process currently in place.	

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	20 years or below $844; Experience per year premium for above 20 years $219. School Computer Technician: Base salary $38,432; Bachelor's or above premium $13,261; State experience per year premium $641. Supervisory Aide: Base salary $16,980; Bachelor's or above premium $1,977; State experience per year premium $273. School Secretary: Base salary $28,973; State experience per year premium $397. School Clerical: Base salary $22,152; State experience per year premium $305. Central Office Classified: Base salary $31,269; State experience per year premium $397. Central Office Maintenance and Operations: Base salary $31,526; State experience per year premium $467. Custodian: Base salary $25,593; State experience per year premium $467.	20 years or below $876; Experience per year premium for above 20 years $227. School Computer Technician: Base salary $39,873; Bachelor's or above premium $13,758; State experience per year premium $665. Supervisory Aide: Base salary $17,556; Bachelor's or above premium $2,044; State experience per year premium $282. School Secretary: Base salary $29,770; State experience per year premium $411. School Clerical: Base salary $22,903; State experience per year premium $316. Central Office Classified: Base salary $32,330; State experience per year premium $411. Central Office Maintenance and Operations: Base salary $32,595; State experience per year premium $483. Custodian: Base salary $26,462; State experience per year premium $483.		

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	Amounts in this column have been inflated to levels in the Legislative Model and 2015 EB Recommendation columns.			
34. Health Insurance	Compute a health insurance composite amount for each generated FTE based upon prior year statewide average district weighted actual participation in district health insurance plans as to the proportion of employee only, split contract, employee plus spouse or children and family coverage for the State's health insurance contribution amounts paid on behalf of State employees as of January 1 of the preceding school year. For FY 2011-12 the per FTE amount is $12,804.59. *Amount in this column has been inflated to levels in the Legislative Model and 2015 EB Recommendation columns.*	Compute a health insurance composite amount for each generated FTE based upon prior year statewide average district weighted actual participation in district health insurance plans as to the proportion of employee only, split contract, employee plus spouse or children and family coverage for the State's health insurance contribution amounts paid on behalf of State employees as of January 1 of the preceding school year. For FY 2015-16 the per FTE amount is $14,958.29.	Compute a health insurance composite amount for each generated FTE based upon prior year statewide average district weighted actual participation in district health insurance plans as to the proportion of employee only, split contract, employee plus spouse or children and family coverage for the State's health insurance contribution amounts paid on behalf of State employees as of January 1 of the preceding school year. For FY 2015-16, the per FTE amount is $14,958.29.	$0
35. Benefits	<u>Worker's Compensation</u>: 0.70% of salary. <u>Unemployment Insurance</u>: 0.06% of salary. <u>Retirement</u>: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share).	<u>Worker's Compensation</u>: 0.70% of salary. <u>Unemployment Insurance</u>: 0.06% of salary. <u>Retirement</u>: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and reimburse actual expenditures as required by current law (1.25% employer	<u>Workers' Compensation</u>: 0.70% of salary. <u>Unemployment Insurance</u>: 0.09% of salary. <u>Retirement</u>: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and State decide on reimbursement of additional retirement costs currently	$0 *Note: estimate is variable to salary and FTEs* $0

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	share and 0.375% employee share – FY 2016-17 only). Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	reimbursed (1.25% employer share and 0.375% employee share – FY 2016-17 only). Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	$0
36. Regional Cost Adjustment	Adjust salaries by the 2011 Hedonic Wage Index (HWI) as calculated in Dr. Lori Taylor.	Provide the greater of the 2005 Hedonic Wage Index (HWI) or the average of the last six Wyoming Cost of Living Indices (WCLI), with a minimum of 1.0 (statewide average).	Adjust salaries by the 2015 OES CWI as calculated in Dr. Lori Taylor's report to the Select Committee.	Evidence-Based RCA: 2015 OES CWI: Cumulative difference of ($3,432,407). Legislative Model RCA: Greater of 2005 HWI or WCLI: Cumulative difference of $32,632,729 Net difference in RCAs is ($36,065,136)
ADDITIONAL ISSUTES RELATED TO THE WYOMING K-12 FUNDING MODEL				
37. External Cost Adjustment	Monitoring process established by W.S. 21-13-309(u). Recommended cost indices include: • Professional staff – use a Wyoming specific Comparable Wage Index; • Non-professional staff – use a Wyoming specific High School Comparable Wage Index; • Supplies and Materials – use the Producer Price Index for Office Supplies and Accessories; and	Monitoring process established by W.S. 21-13-309(u). Recommended cost indices include: • Professional staff – use a Wyoming specific Comparable Wage Index; • Non-professional staff – use a Wyoming specific High School Comparable Wage Index; • Supplies and Materials – use the Producer Price Index for Office Supplies and Accessories; and	Monitoring process established by W.S. 21-13-309(u). Recommended cost indices include: • Professional staff – use a Wyoming specific Comparable Wage Index; • Non-professional staff – use a Wyoming specific High School Comparable Wage Index; • Supplies and Materials – use the Producer Price Index for Office Supplies and Accessories; and	N/A

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
	• Energy – use the Producer Price Index (PPI) for Commercial Electric Power (weighted at 44.1%) and the PPI for Commercial Natural Gas (weighted at 55.9%).	• Energy – use the Producer Price Index (PPI) for Commercial Electric Power (weighted at 44.1%) and the PPI for Commercial Natural Gas (weighted at 55.9%).	• Energy – use the Producer Price Index (PPI) for Commercial Electric Power (weighted at 28.12%), the PPI for Commercial Natural Gas (weighted at 59.41%) and PPI for Gasoline (weighted at 11.83%).	
38. School District School Finance Audit Process	N/A	Conduct school finance audits in accordance with W.S. 9-1-513.	Continue the school finance audit process and require the WDE to periodically review the rules and regulations for the school finance model elements and guidance concerning data needs from each district to operate the statewide payment model, especially after a recalibration. The rules and regulations should clearly define every data element of the statewide payment model and provide clear guidelines on how districts should report those data so school districts, the DOA and the WDE have the same understanding of what data should be reported and what are allowable and non-allowable reimbursable expenditures.	N/A
ADDITIONAL ITEMS THE 2015 SELECT COMMITTEE REQEUSTED TO BE ANALYZED				
Preschool/Early Childhood Education Programs		Not part of the educational basket of goods and services or the Legislative Model. *Note: The Legislature has appropriated $665,000 for BY 2015-2-16 for early child hood*	Provide a voluntary, full-day Preschool program for all children aged 3 and 4 as a categorical program outside the block grant, funded at the rate of $14,271 for every 1.0 full day preschool student.	Estimated cost of $128.4 million assuming 60% of eligible students would attend a preschool program.

Model Element	2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference between 2015 EB Model and Legislative Model
		grants to school districts or other nonprofit service providers developing, enhancing and sustaining high quality early childhood education programs, including programs targeting educationally disadvantaged children. Additionally, $75,000 was appropriated to the Department of Family Services to coordinate early childhood programs among state agencies. Agency is required to report to the Joint Education Committee by December 1, 2015. (See 2014 Laws, Chapter 26, Section 335).		
School Resource Officers (SROs)/School Security		Not part of the educational basket of goods and services or the Legislative Model.	Do not recommend funding SROs, but if the Legislature elects to do so, it should be funded through a categorical grant program that reimburses the portion of time SROs actually spend in school (175 school days times 6.5 hours) and assumes that local government agencies remain the employers of SROs for insurance and equipment purposes. A comprehensive school safety and security program should include additional mechanisms, such as climate surveys and coordination of local law enforcement, emergency responders and public schools.	Unknown.

STAFFING FOR CORE PROGRAMS

This section covers full-day kindergarten, core teachers, elective/specialist teachers, minimum teachers, substitute teachers, instructional facilitators/coaches, core tutors, core guidance counselors, core nurses, substitute teachers, supervisory aides, librarians, principals/assistant principals and school secretarial and clerical staff.

1. Full-Day Kindergarten

The table below shows the 2010 and 2015 EB recommendations and the Legislative Model call for full-day kindergarten. Details on the resources kindergarten students generate are included in the sections below.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Full-day kindergarten provided.	Full-day kindergarten provided. At least one school in each district must have a full-day kindergarten program.	Full-day kindergarten provided.	$0

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Research shows that full-day kindergarten, particularly for students from low-income backgrounds, has significant, positive effects on student learning in the early elementary grades (Gullo, 2000; Slavin, Karweit & Wasik, 1994). Fusaro's (1997) late 1990s meta-analysis of 23 studies comparing the achievement effect of full-day kindergarten to half-day kindergarten programs, found an average effect size of +0.77, which is substantial.[2] Children participating in full-day kindergarten programs do better in learning the basic skills of reading, writing, and mathematics in the primary grades than children who receive only a half-day program or no kindergarten at all (see also Lee, Burkam, Ready, Honigman & Meisels, 2006).

In 2003, using nationally-representative, longitudinal data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS–K), Denton, West & Walston (2003) showed children who attended full-day kindergarten had a greater ability to demonstrate reading knowledge and skill than their peers in half-day programs, across the range of family backgrounds. Cooper, et al.'s (2010) comprehensive meta-analysis reached similar conclusions finding the average effect size of students in full-day versus half-day kindergarten to be +0.25. Moreover, a randomized controlled trial found the effect of full-day versus half-day kindergarten to be about +0.75 standard deviations (Elicker & Mathur, 1997). As a result of this research, funding full-day kindergarten for 5 year-olds as well as for 4 year-olds is an increasingly common practice among the states (Kauerz, 2005). Since research suggests children from all backgrounds can benefit from full-day kindergarten programs, the EB Model supports a full-day kindergarten program for all students.

[2] Effect size is the amount of a standard deviation in higher performance that the program produces for students who participate in the program versus students who do not. An effect size of 1.0 indicates that the average student's performance would move from the 50th to the 83rd percentile. The research field generally recognizes effect sizes greater than 0.25 as significant and greater than 0.50 as substantial.

2015 EB Recommendation: Fund full-day kindergarten programs.

2. Elementary Core Teachers/Class Size

Core teachers are defined as the grade-level classroom teachers in elementary schools. In middle and high schools, core teachers are those who teach core subjects such as mathematics, science, language arts, social studies and world languages. Advanced Placement (AP) or International Baccalaureate (IB) classes in these subjects are considered core classes.

In the analysis that follows, we provide information on the number of teachers employed by school districts in Wyoming as compared to the number of teachers generated through the Legislative Model. There are several factors to consider in the analysis that follows.

- The data we present on resource use come from the *Continuing Review of Educational Resources in Wyoming* (CRERW) report prepared annually by the Wyoming Department of Education (WDE).
- The data on numbers of teachers compared to the Legislative Model does not distinguish between core and specialist teachers; consequently some comparisons below are presented in the discussion of core teachers and others following the discussion of specialist or elective teachers.
- Many of Wyoming's schools contain grade spans not easily categorized at elementary, middle or high school (e.g. K-12 schools, alternative schools, etc.). The WDE reports data for these schools as well as more traditionally organized schools. Tables presented here rely on traditionally organized schools, but tables that include the same data for all schools (as well as summarize district-by-district findings when appropriate) are provided following the discussion of specialist/elective teachers.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Grades K-3: 15; Grades 4-5/6: 25. Average class size of 17.3 (K-5) or 18.3 (K-6).	Grades K-5/6: 16. Average class size of 16 (K-5/6).	Grades K-3: 15; Grades 4-5/6: 25. Average class size of 17.3 (K-5) or 18.3 (K-6).	-218.44 FTEs, ($16,911,902)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

The primary evidence on the impact of small classes today is the Tennessee STAR study, which was a large scale, randomized controlled experiment of class sizes of approximately 15 students compared to a control group of classes with approximately 24 students in kindergarten through grade 3 (Finn and Achilles, 1999; Word, et al., 1990). The study found students in the small classes achieved at a significantly higher level (effect size of about 0.25 standard deviations) than those in regular class sizes, and the impacts were even larger (effect size of about 0.50) for low income and minority students (Finn, 2002; Grissmer, 1999; Krueger, 2002). The same research also showed a regular class of 24-25 students with a teacher and an instructional aide *did not* produce a discernible positive impact on student achievement, a finding that undercuts proposals and wide spread practices that place instructional aides in elementary classrooms (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001).

Subsequent research showed the positive impacts of the small classes in the Tennessee study persisted into middle and high school years, and the years beyond high school (Finn, Gerber, Achilles & J.B. Zaharias, 2001; Konstantopoulos & Chung, 2009; Krueger, 2002; Mishel & Rothstein, 2002; Nye, Hedges & Konstantopoulos, 2001a, 2001b). Longitudinal research on class size reduction also found the lasting benefits of small classes include a reduction in the achievement gap in reading and mathematics in later grades (Krueger & Whitmore, 2001).

Although some argue the impact of the small class sizes is derived primarily from kindergarten and grade 1, Konstantopoulos and Chung (2009) found the longer students were in small classes (i.e., in grades K, 1, 2 and 3) the greater the impact on grade 4-8 achievement. They concluded the full treatment – small classes in all of the first four grades – had the greatest short and long term impacts.

Though differences in analytic methods and conclusions characterize some of the debate over class size (see Hanushek, 2002 and Krueger, 2002), we side with those concluding class size makes a difference, but only class sizes of approximately 15 students with one teacher (and not class sizes of 30 with an aide or two teachers) and only for kindergarten through grade 3.

Finally, in these times when funds for schools are scarce, it is legitimate to raise the issue of the cost of small classes versus the benefits. Whitehurst and Chingos (2011) argue that though the Tennessee STAR study supports the efficacy of small classes, there is other research today that produced more ambiguous conclusions. However, they also note the other research includes class size reductions in grades above K-3 and “natural experiments” rather than randomized controlled trials. Most importantly, they also conclude that while the costs of small classes are high, the benefits, particularly the long-term benefits, outweigh the costs and conclude small class sizes in grades K-3 “pay their way.”

We consistently recommend states fund all other elements of the EB Model before putting funds into smaller class sizes. We have made this recommendation because research shows many other components of the EB Model are more cost effective in terms of improving student performance – particularly for improving the performance of struggling students.

Resource Use Analysis

Table 3.2 shows elementary schools in Wyoming employed 488.7 fewer core and specialist teachers than were funded through the Legislative Model in SY 2013-14. As a result, average class sizes in elementary schools exceed the Legislative Model of 16 students at 18.46 students for SY 201-14. The WDE points out in its analysis that across the State the difference between the Legislative Model and district employed teachers decreased by 12.7 teachers from SY 2012-13 to SY 2013-14. This suggests the Legislature’s mandate of class size for grades K-3 be limited to 16 has had an impact on resource allocation at elementary schools.

Table 3.2 Comparison of Number of Teachers in Wyoming Elementary Schools Compared to Number of Teachers Funded through the Legislative Model, SY 2013-2014

Elementary School Size Category	Number of Schools	Average ADM Per School	Difference in Number of Teachers From Wyoming Funding Model
Small (<= 49 ADM)	34	17	(25.1)
Mid-size (>49 and <=96 ADM)	68	8	(0.7)
Large (> 96 ADM)	152	299	(441.9)
All Elementary Schools	194	240	(488.7)

Source: *CRERW Report 2005-06 through 2013-14.* WDE, October 2014.

Additional Analyses for the 2015 Recalibration

The issue of class size and staffing ratios is perhaps the most important cost issue. Establishing the staffing ratios determines the total core and elective teacher (these terms are defined below) staffing resources for all schools and is the single largest cost component.

Despite the importance of this issue, there may be some misunderstanding about class size and staffing ratios and how many total teaching resources are generated in the EB and Legislative Models. Additionally, we discuss the teaching resources provided by the MAP Model prior to the 2005 recalibration. The EB Model represents Picus Odden & Associates estimates of adequate resource levels for Wyoming. The Legislative Model represents the actual parameters determined by the Legislature and is used to allocate revenues to Wyoming school districts. The MAP Model was used in Wyoming prior to SY 2006-07, and is included to help clarify the issues of class size so readers understand the number of teachers each Model generated in prototypical schools. The purpose of this analysis is to clarify the terms staffing ratios and class size, explain the differences among the three Models, and provide information that can be used to specify teacher resources.

In the EB and Legislative Models, teacher resources are generated as either core teachers or elective teachers. Core teachers are the grade level classroom teachers in elementary schools and core subject matter teachers – math, science, social studies, English/language arts and world languages – in middle and high schools. Elective or specialist teachers cover other areas such as art, music, physical education, health, career and technical education, and any class outside of core subjects. Elective teachers are generated as a percent of core teachers at each school in the EB and Legislative Models. The MAP Model did not distinguish between core and elective teachers.

The first step is to clarify the phrase "class size" and the phrase "staffing ratio." Understanding the distinction between the two is critical to understanding the differences in the number of teachers each of the Models (EB, Legislative and MAP) generate in a prototypical school.

- *Class Size:* In the EB and Legislative Models, class size is used to determine the number of core teachers in each school. The number of core teachers is then used to determine the number of elective teachers, which is specified as a percent of core teachers. The total number of teachers who provide classroom instruction at any school is the sum of the core and elective teachers.
- *Staffing Ratio:* Once the number of core and elective teachers is calculated, a staffing ratio can be determined by dividing the total number of (core and elective) teachers into the number of

students in the school. Although the staffing ratio is not used in the EB or Legislative Models, it was used to generate the number of teachers in each school under the MAP Model.

All of this is important because the Models generate different numbers of teachers for the same size prototype schools, as included in Table 3.3. The percentage used to calculate elective teachers in the EB and Legislative Models is based on assumptions about the number of instructional hours (minutes) required of each teacher each day as follows:

- Elementary Schools: If it is assumed the instructional day is divided into six equal segments or periods, and each teacher provides instruction for five of the periods, then for every core teacher an additional 20% of a teacher is needed to cover the sixth period. This concept works for both a six-hour instructional day in self-contained (elementary school) classrooms and for a six period school day in schools with departmentalized (secondary school) classrooms.
- Secondary Schools – Seven Periods: If it is assumed the instructional day is divided into seven equal segments or periods, and each teacher provides instruction for five of the periods, then for every core teacher an additional 40% of a teacher is needed to cover the sixth and seventh periods. However, some secondary schools in Wyoming have seven period days and require teachers to provide instruction for six of the periods; this requires only 14% for elective teachers.
- Secondary Schools – Block Schedule: If it is assumed the instructional day is divided into four equal segments or periods (a block schedule in a secondary school), and each teacher provides instruction for three of the periods/blocks, then for every core teacher an additional 33 1/3% of a teacher is needed to cover the fourth period/block.

The class size approach is explicit about the class sizes in the formula resources; it is used to determine the number of core teachers in a school and from that the number of elective teachers. The total of core and elective teachers can then be used to calculate the implicit “staffing ratio” for the EB and Legislative Models.

Conversely, the staffing ratio approach, as incorporated into the MAP Model, was silent about class sizes. In the MAP Model, the staffing ratio was first used to determine a number of teachers for a school by dividing the staffing ratio into the number of students in the school. The resulting number of teachers assumed both core and elective teachers.

The issue that remains is the Legislative Model’s class sizes are using the MAP Model’s staffing ratios. Using staffing ratios to estimate class sizes yields the following calculations and assumptions about the number of instructional hours (minutes) for each teacher. For elementary schools, if a six period day is assumed and core teachers provide five hours of instruction, then the class size supported by the staffing ratio is 1.2 times the staffing ratio. For secondary schools, if a seven-period/segment day is assumed, the class size supported by the staffing ratio is 1.4 times the staffing ratio. For secondary schools using a four period/block, the class size supported by the staffing ratio is 1.33 times the staffing ratio.

In order to compare the three Models, it is necessary to calculate an “implied” class size for the staffing ratio approach (MAP Model) and to calculate an “implied” staffing ratio from the class size approach (EB and Legislative Models). Both can be used, but understanding the connections between and the mathematics of those connections, is key to making valid comparisons across the Models.

Table 3.3 compares the class sizes in the MAP, EB and Legislative Models. As described above, the MAP Model relies on staffing ratios to allocate teaching resources to schools while the EB and Legislative Models rely on class sizes to allocate teaching resources to schools. To compare, we have calculated the implied class size from the MAP Model approach (staffing ratios are displayed below in Table 3.4). As a result, the MAP Model's class sizes displayed in Table 3.3 are "implied" and have been calculated from the MAP Model staffing ratios of 16:1 for elementary schools and 21:1 for middle and high schools as outlined above.

Table 3.3 Comparison of MAP, EB and Legislative Model Class Sizes

School/Grade Category	Class Size in Model		
	MAP Model*	**EB Model**	**Legislative Model**
Elementary Schools			
Core Teachers			
K-3	19.2	15.0	16.0
4-5(6)**	19.2	25.0	16.0
Average	19.2	17.3(18.1)***	16.0
Elective Teachers	20%	20%	20%
Middle Schools			
Core Teachers	25.2	25.0	21.0
Elective Teachers	20%	20%	33%
High Schools			
Core Teachers	25.2	25.0	21.0
Elective Teachers	20%	33 1/3%	33%

Source: Authors' calculations.
*Implied from the MAP Model staffing ratios assuming six hours of instruction with each individual teacher providing five of those hours. Class sizes would be larger if a block schedule were assumed.
**Sixth grade is funded as an elementary school or middle school depending on where the sixth grade is included.
***18.1 is the average in a three unit elementary school with 48 sixth graders and a total enrollment of 336 (288 + 48).

The conversion of staffing ratios to class size for the MAP Model makes comparisons among the Models more straightforward. The 2005 recalibration process enacted the MAP Model *staffing ratios* into Legislative Model as *class sizes* and added elective teachers on top of the Legislative Model *class sizes*. The result was a substantial increase in the number of teachers resourced in the Legislative Model versus the MAP Model.

The staffing ratios in the MAP Model and the staffing ratios computed from the class size parameters of the EB and Legislative Models are displayed in Table 3.4. The higher the staffing ratio displayed, the larger the class size. As Table 3.4 shows, the MAP Model has the highest staffing ratios and thus results in the largest class sizes. The computed staffing ratios for the Legislative Model are the lowest and those for the EB Model are in between.

Table 3.4 Staffing Ratios for the MAP, EB and Legislative Funding Models

School Level	MAP Model	EB Model	Legislative Model
Elementary	1: 16.00	1: 14.20	1: 13.33
Middle	1: 21.00	1: 20.83	1: 15.79
High school	1: 21.00	1: 18.75	1: 15.79

Source: Authors' calculations.

The question that remains is to determine how many core and elective teachers are generated by prototypical elementary, middle and high schools. The following three tables provide, by type of school, the staffing ratios and class sizes that result from each of the Models

Table 3.5 presents these data for a prototypical elementary school of 288 students. The assumptions in this table include a six-hour day with the core teacher in class for five hours and an elective teacher for one hour as described above. To understand how to read Table 3.5, consider column (2), which describes the number of teachers and class size for the MAP Model. In grades K-3, there are a total of 192 students in the prototypical elementary school (48 students per grade multiplied by four grades). As shown in Table 3.3, the computed class size for a prototypical elementary school in the MAP Model is 19.2, which generates 10 core teachers. There are 96 students in grades 4 and 5 (48 students per grade multiplied by two grades) generating five more core teachers (row 3) for a total of 15 core teachers (row 4). Our assumption of 20% elective teachers yields three elective teachers (row 8) for a total of 18 core and elective teachers (row 9) or a staffing ratio of 16:1 for the MAP Model (row 10). This is, of course, the staffing ratio used in the MAP Model.

For the EB Model (column 3) and Legislative Model (column 4) the process is reversed. In row 2 using the class size of 15 (EB Model) or 16 (Legislative Model), a staffing ratio of 12.80 (EB Model) and 12 (Legislative Model) is computed (e.g. as shown in column 4, the 192 K-4 students are divided by the class size of 16 to generate 12 teachers). The number of students in grades 4-5 is used to generate core teachers for those grades in row 3 and total core teachers are displayed in row 4. The elective teacher ratio of 20% is applied to the number of core teachers totaling 3.33 elective teachers for the EB Model and 3.6 elective teachers for the Legislative Model. Row 9 shows 19.97 total teachers in the EB Model and 21.6 for the Legislative Model. The implied staffing ratios, displayed in row 10 are 14.42:1 for the EB Model and 13.33:1 for the Legislative Model.

Table 3.5 Class Sizes, Staffing Ratios and Numbers of Core and Elective Teachers for a Prototypical Elementary School, 288 Students, 48 Students per Grade

Row	(1) Teacher Category	(2) MAP Model Number of Teachers (Class Size)	(3) EB Model Number of Teachers (Class Size)	(4) Legislative Model Number of Teachers (Class Size)
1	**Core**			
2	K-3	10.00 (19.2)	12.80 (15)	12.00 (16)
3	4-5(6)*	5.00 (19.2)	3.84 (25)	6.00 (16)
4	Total Core	15.00	16.64	18.00
5	**Elective**			
6	K-3	2.00 (19.2)	2.56 (15)	2.40 (16)
7	4-5	1.00 (19.2)	0.77 (25)	1.20 (16)
8	Total Elective	3.00	3.33	3.60
9	Total Core plus Elective Teachers	18.00	19.97	21.60
10	Implied Staffing Ratio	1 Teacher per 16.00 Students	1 Teacher per 14.42 students	1 Teacher per 13.33 students

Source: Authors' calculations.
*Sixth grade is funded as an elementary school or middle school depending on where the sixth grade is included.

Similar computations are made for prototypical middle and high schools in Tables 3.6 and 3.7, respectively. As with the elementary prototypical schools, the MAP Model has the highest staffing ratio and largest class size, while the Legislative Model has the lowest staffing ratio and smallest class size. The EB Model is in the middle for all three prototypical school types.

Table 3.6 Class Sizes, Staffing Ratios and Numbers of Core and Elective Teachers for a Prototypical Middle School, 315 Students, 105 Students per Grade

Row	(1) Teacher Category	(2) MAP Model Number of Teachers (Class Size)	(3) EB Model Number of Teachers (Class Size)	(4) Legislative Model Number of Teachers (Class Size)
1	**Core**			
2	6-8	12.50 (25.2)	12.60 (25)	15.00 (21)
3	Total Core	12.50	12.60	15.00
4	**Elective**			
5	6-8	2.50 (25.2)	2.52 (25)	4.95 (21)
6	Total Elective	2.50	2.52	4.95
7	Total Core plus Elective Teachers	15.0	15.12	19.95
8	Implied Staffing Ratio	1 Teacher per 21 Students	1 Teacher per 20.83 students	1 Teacher per 15.79 students

Source: Authors' calculations.

Table 3.7 Class Sizes, Staffing Ratios and Numbers of Core and Elective Teachers for a Prototypical High School, 630 Students, 210 Students per Grade

Row	(1) Teacher Category	(2) MAP Model Number of Teachers (Class Size)	(3) EB Model Number of Teachers (Class Size)	(4) Legislative Model Number of Teachers (Class Size)
1	**Core**			
2	9-12	25.00 (25.2)	25.20 (25)	30.00 (21)
3	Total Core	25.00	25.20	30.00
4	**Elective**			
5	9-12	5.00 (25.2)	8.40 (25)	9.90 (21)
6	Total Elective	5.00	8.40	9.90
7	Total Core plus Elective Teachers	30.0	33.60	39.90
8	Implied Staffing Ratio	1 Teacher per 21.00 Students	1 Teacher per 18.75 students	1 Teacher per 15.79 students

Source: Authors' calculations.

One difference between the MAP Model and the EB and Legislative Models is that the assumptions made about how a school is organized do not change the staffing ratio in the MAP Model, whereas the EB and Legislative Models provide additional elective teachers to accommodate block schedules in high schools (and middle schools under the Legislative Model).

This explanation is provided so policy makers and school officials understand the difference in the number of teaching positions generated through each Model. Tables 3.5, 3.6 and 3.7 illustrate the Legislative Model resources the most teachers, and the MAP Model resources the fewest teachers in prototypical schools. In the 2005 recalibration process, the EB Model reflects the teacher staffing recommendations, while the Legislative Model relies on the EB Model approach, but starts with the staffing ratios developed initially for the MAP Model. The result is the Legislative Model generates the most teachers of the three approaches.

Cost Implications

Table 3.8 provides the estimated cost differences between the EB Model and Legislative Model class sizes. Note, this analysis does not take into account small or minimum teacher resources, and uses estimated 2015-16 Model ADM and compensation[3] amounts. The elementary class sizes in the Legislative Model cost an estimated $25.6 million more compared to the EB Model, for school year 2015-16. The smaller middle and high school class sizes in the Legislative Model cost an additional $43.1 million compared to the EB Model, for school year 2015-16. The greater elective teacher allocation in the Legislative Model combined with the smaller core class size for middle schools (33% v. 20%) cost an estimated $11.7 million compared to the EB Model, for school year 2015-16. In total, the smaller classes and more electives provided by the Legislative Model cost an estimated $64.6 million compared to the EB Model for school year 2015-16.

Table 3.8 Estimated FTE and Cost Differences between the Legislative Model and EB Model for School Year 2015-16

	FTEs			Compensation		
Grade	**EB Model**	**Legislative Model**	**Difference**	**EB Model**	**Legislative Model**	**Difference**
Elementary						
Core	2,798.87	3,016.91	218.04	$217,143,193	$242,694,842	$25,551,649
Elective	559.77	603.38	43.61	$43,428,639	$48,538,968	$5,110,330
Total	3,358.64	3,620.29	261.65	$260,571,832	$291,233,811	$30,661,978
Middle						
Core	754.96	888.06	133.10	$11,667,307	$23,540,965	$11,873,658
Elective	150.99	293.06	142.07	$58,336,533	$71,336,257	$12,999,724
Total	905.96	1,81.12	275.17	$70,003,840	$94,877,222	$24,873,382
High						
Core	1,007.01	1,146.21	139.19	$77,705,037	$92,089,205	$14,384,168
Elective	335.67	378.25	42.58	$25,901,679	$30,389,438	$4,487,759
Total	1.342.69	1,524.45	181.77	$103,606,716	$122,478,643	$18,871,926
Grand Total	**5,607.29**	**6,325.86**	**718.59**	**$434,182,388**	**$508,589,676**	**$74,407,287**

Source: LSO calculations using estimating EB and Legislative Models.

2015 EB Recommendation: Elementary core class sizes, grades K-3 of 15 and grades 4-5, core class sizes of 25; average of 17.3.

[3] The EB Model uses the 2015 OES CWI as the regional cost adjustment and the Legislative Model uses the greater of the 2005 HWI or WCLI with a minimum of 1.00.

3. Secondary Core Teachers/Class Size

In middle and high schools, core teachers are those who teach core subjects such as mathematics, science, language arts, social studies and world languages. AP and IB classes in these subjects are considered core classes.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Grades 6-12: 25.	Grades 6-12: 21.	Grades 6-12: 25.	Middle school: -133.10 FTEs, ($10,305,284) High school: -139.19 FTEs, ($10,803,036)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

There is less research evidence on the most effective class sizes in grades 4-12 than there is on effective class size in grades K-3. As a result, in developing the EB Model, we seek evidence on the most appropriate secondary class size from typical and best practices to identify the most appropriate class size for these grades. The national average class size in middle and high schools is roughly 25 students, and nearly all comprehensive school reform models were developed on the basis of a class size of 25 students (Odden, 1997; Stringfield, Ross & Smith, 1996) a conclusion on class size reached by the dozens of experts who created these whole-school design models. Although many professional judgment panels in many states have recommended secondary class sizes of 20, none cited research or best practices to support that proposal.

Citing more recent studies, Whitehurst and Chingos (2011) argue there might be a modest linear relationship in improving student performance when class size drops from between 25 and 30 students to 15, but our view of the evidence and impact is that the gains identified are modest at best, and insufficient to alter the EB Model class size recommendations.

Resource Use Analysis

The EB Model's middle and high school class size of 25 students is larger than the Legislative Model class size of 21 students. As described above, our understanding is the use of class sizes of 21 students in these grades came from the original adequacy study that created the MAP Model and it was intended as a "staffing ratio" for secondary schools. The staffing ratio of 21 students per teacher was intended to include all teaching staff and did not distinguish between core teachers and elective teachers. If one assumes 21 is a "staffing ratio" and includes core and elective teachers, and if one further assumes each teacher provides instruction for five of six instructional hours of the regular school day, then the staffing ratio of 21 translates to a core class size of about 25.2, essentially equal to the EB Model ratio of 25. But the EB Model and the Legislative Model add 20% and 33%, respectively, more elective teachers to middle schools and 33 1/3% and 33%, respectively, more elective teachers for high schools. As a result, both the EB Model and the Legislative Model provide more teacher resources than the MAP Model.

The Table 3.9 below displays the difference in the number of teachers generated by the Legislative Model and the number of teachers actually employed by school districts in middle and high schools. Data are presented for all middle and all high schools as well as by school size categories. It is interesting to note that at the middle school level, regardless of the size of the school, districts employ fewer teachers than the Legislative Model allocates to middle schools. On the other hand, except for the eight mid-sized high schools, districts employ more high school teachers than the Legislative Model generates. Specifically, across all middle schools in Wyoming there are 27.0 fewer teachers than the Legislative Model funds and at high schools, there are 20.4 fewer teachers than the Legislative Model funds. These numbers are relatively small compared to the total of 488.7 fewer teachers employed at the elementary level.

Table 3.9 Comparison of Number of Teachers in Wyoming Middle and High Schools Compared to Number of Teachers Funded Through Legislative Model, SY 2013-2014

Secondary School Size Category	Number of Schools	Average ADM Per School	Difference in Number of Teachers From Legislative Model
Middle Schools			
Small (<= 49 ADM)	8	20	(5.1)
Mid-size (>49 and <=105 ADM)	9	68	(21.1)
Large (> 105 ADM)	42	397	(0.7)
All middle Schools	59	296	(27.0)
High Schools			
Small (<= 49 ADM)	7	33	(0.4)
Mid-size (>49 and <=105 ADM)	6	75	(5.1)
Large (> 105 ADM)	41	535	(15.0)
All High Schools	54	419	(20.4)

Source: *CRERW Report 2005-06 through 2013-14.* WDE, October 2014.

2015 EB Recommendation: Secondary core class sizes, grades 6-12 of 25.

4. Elective/Specialist Teachers

In addition to core classroom teachers, the EB Model provides elective or specialist teachers to support core teachers. Generally, non-core or elective teachers, also called specialist teachers, offer courses in subjects such as music, band, art, physical education, health, career-technical education, etc. A combination of core and elective teachers allows time during the school day for all teachers to collaborate on instructional plans, participate in professional development activities and otherwise plan for class instruction.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Elementary Schools			
20% of core elementary school teachers.	20% of core elementary school teachers.	20% of core elementary school teachers.	-43.69 FTEs, ($3,382,380)
Middle Schools			
20% of core middle school teachers.	33% of core middle school teachers.	20% of core middle school teachers.	-142.07 FTEs, ($11,010,016)
High Schools			
33 1/3% of core high school teachers.	33% of core high school teachers.	33 1/3% of core high school teachers.	-42.58 FTEs, ($3,304,380)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

In addition to the core subjects addressed above, schools need to provide a solid well-rounded curriculum including art, music, library skills and physical education. Teachers also need some time during the regular school day to work collaboratively and engage in job-embedded professional development. Providing every teacher one period a day for collaborative planning and focused professional development requires an additional 20% allocation for elective teachers. Using this elective staff allocation, every teacher – core and elective – would teach five of six periods during the day, and have one period for planning, preparation and collaborative work. One of the most important elements of effective collaborative work is team-focused data-based decision making, using student data to improve instructional practices, now shown to be effective by a recent *randomized controlled trial* (Carlson, Borman & Robinson, 2011).

The 20% additional staff is adequate for elementary and middle schools, but the EB Model establishes a different argument for high schools. If the goal is to have more high school students take a core set of rigorous academic courses, and learn the course material at a high level of thinking and problem solving, cognitive research findings suggest that use of longer class periods, such as a block schedule, is a better way to organize the instructional time of a high school. (Bransford, Brown and Cocking, 1999; Donovan & Bransford, 2005a, 2005b, 2005c). Typical block scheduling for high schools includes four 90-minute blocks where teachers provide instruction for three of those 90-minute blocks and have one block – or 90 minutes – for planning, preparation and collaboration each day. This schedule requires elective teachers at a rate of 33 1/3% of the number of core teachers. This block schedule would operate with students taking four courses each semester attending the same classes each day, or with students taking eight courses each semester while attending different classes every other day. Such a schedule could also entail a few “skinny” blocks (45 minute periods) for some classes. Each of these specific ways of structuring a block schedule, however, would require an additional 33 1/3% of the number of core teachers to serve as elective teachers to provide the regular teacher with a “block” for planning, preparation and collaboration each day.

It should be noted that staffing recommendation for high schools would be sufficient for high schools to provide all students with a rigorous set of courses throughout grades 9-12, and an appropriate number of credits required for high school graduation to quality for Hathaway scholarships or be college ready for any post-secondary institution in the country.

It should be noted the elective teacher recommendation described above does not provide sufficient resources, at the same class sizes, for either middle schools or high schools to offer a 7 period day and require teachers to instruct for only 5 of those periods. The EB Model does not resource schools at that level for two primary reasons. First, the EB Model formulates recommendations on strategies and resources to dramatically improve student performance in the core subjects of reading/English/language arts, mathematics, science, history/geography and world languages, in part by providing nearly an hour of instruction in each of these subjects daily. Restructuring the day to add a seventh period is usually accomplished by reducing the minutes of instruction in core subjects, and thus is not a strategy that is likely to boost performance in those subjects, regardless of the arguments about the motivational aspects of elective classes. Second, increasing the provision of specialist and elective teachers to 40% in both middle and high schools is more costly. Therefore, a recommendation of 40% specialists and elective teachers in secondary schools would result in added costs and a potential decrease in instructional effectiveness for the core subjects, something that is not aligned with the framework for the EB approach to adequacy.

Nevertheless, the Legislative Model provides elective teachers for middle schools at the same rate as for high schools – 33% of core teachers – and thus exceeds the EB Model's recommendations.
Resource Use Analysis

The analysis of core teachers includes a comparison of the number of teachers in Wyoming with the number of teachers allocated to school districts through the Wyoming Funded Model. That analysis showed a substantial number of teacher positions that were funded but not filled as teachers by the state's 48 school districts. Additionally, that analysis only included what we termed "traditionally organized" schools. There are a number of other school types in Wyoming that should be considered. In this analysis we provide information on teachers in other (not traditionally organized) schools, as well as statewide total data for the allocation of teachers across the districts.

Table 3.10 summarizes the differences between the number of teachers (core and specialist) generated by the Legislative Model and the number of teachers employed by Wyoming school districts in schools configured differently than traditional elementary (K-5/6), middle (6-8) and high (9/10-12) schools – using the definitions of school types used by the WDE in the CRERW report. In all four types of schools, there are substantially fewer teachers than generated by the Legislative Model. This likely occurs because of the large number of minimum teachers the Legislative Model provides at each grade prototype (six for elementary schools, eight for middle schools and 10 for high schools).

Table 3.10 Comparison of Number of Teachers in Wyoming Schools Compared to Number of Teachers Funded Through Legislative Model, SY 2013-2014

School Size Category	Number of Schools	Average ADM Per School	Difference in Number of Teachers From Legislative Model
K-12	8	149	(17.0)
K-8	13	85	(9.4)
Secondary	8	169	(5.5)
Alternative	16	54	(32.0)

Source: CRERW Report. WDE, October 2014.

Statewide, the Legislative Model funded 6,789.9 core and specialist/elective teaching positions, while districts employed 6,189.0 teachers in SY 2013-14, a difference of 599.9 teaching positions. Among the 48 districts, 35 employed fewer teachers and 13 employed more teachers than the Legislative Model allocated.

Although the number of teachers employed in districts has been lower than the number of teachers allocated through the Legislative Model for all years since SY 2005-06, the difference has fluctuated somewhat since that time. Table 3.11 displays the number of teachers allocated by the Legislative Model, the number employed, the difference, and the number employed as a percentage of allocated teachers for each year between SY 2008-09 and SY 2013-14. The table shows districts have consistently employed about 90% of the number of teachers funded by the Legislative Model.

Table 3.11 Comparison of Number of Teachers in Wyoming Schools Compared to Number of Teachers Funded Through the Legislative Model, SY 2008-09 through SY 2013-2014

School Year	Number of Teachers Allocated in the Model	Number of Teachers Employed by Districts	Difference (Allocated minus Actual)	Actual as a Percent of Teachers Allocated in the Model (%)
2008-09	6,430.00	5,865.00	-565.00	91.21%
2009-10	6,416.30	5,933.00	-483.30	92.47%
2010-11	6,576.60	5,915.00	-661.60	89.94%
2011-12	6,633.60	5,977.10	-656.50	90.10%
2012-13	6,707.60	6,100.10	-607.50	90.94%
2013-14	6,788.90	6,189.00	-599.90	91.16%

Source: *CRERW Report 2005-06 through 2013-14.* WDE, October 2014.

One possible reason Wyoming school districts employ fewer teachers than funded through the Legislative Model may be they pay teachers higher salaries than the Legislative Model provides. Table 3.12 shows the annual disparity between average district salaries and the salaries funded through the Legislative Model. The table clearly shows that since SY 2006-07, the school year the Legislative Model was implemented, districts have paid teachers between $5,000 and $6,000 more per year than what the Legislative Model provides.

Table 3.12 District Average Teacher Salaries Compared to Legislative Model, 2006-07 to 2013-14

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
District Average Regular Salary	$50,892	$52,943	$54,541	$55,779	$56,048	$56,734	$56,740	$56,560
Funding Model Average Salary	$45,126	$46,840	$48,854	$50,662	$50,662	$50,662	$50,662	$50,662
Difference	$5,766	$6,103	$5,687	$5,117	$5,386	$6,072	$6,078	$5,898
% Difference	12.8%	13.0%	11.6%	10.1%	10.6%	12.0%	12.0%	11.6%

Source: *CRERW Report 2005-06 through 2013-14.* WDE, October 2014.

A district-by-district analysis of the difference between teacher salaries calculated in the Legislative Model and actual salaries paid to teachers by school districts shows 41 of 48 districts pay teachers more than the Legislative Model. On average, districts spent 105% of the Legislative Model's salary allocation for teachers, with a high of 126% to a low of 92%.[4]

[4] It is important to note the Legislative Model adjusts the average teacher salary for each district based on the average education and experience of the teaching staff in the district and is further adjusted for regional differences by the RCA.

Additional Analyses for the 2015 Recalibration

Collaborative teacher work in Professional Learning Communities (PLCs) is critical to a school's success. During our meeting with the school improvement Stakeholder Group in Cody, Wyoming on July 1, 2015, representatives of nearly every school district in attendance stated that PLCs were a key element of their success in producing student learning gains.

When teachers work in collaborative teams, they review student data to design standards-based lesson plans and curriculum units, identify interventions for struggling students and monitor all student progress toward meeting performance standards. Research supports the importance of collaborative work of teachers. As noted in several places in this report, collaborative teacher teams are key ingredients in all schools producing large gains in student performance and significant reductions in achievement gaps for at-risk students. The school district representatives at the July 1 meeting affirmed such collaborative teacher work teams have been critical to the performance and student achievement gains they have produced.

In order for schools to create such work teams, pupil-free time must be available during the school day. Creating collaborative time (and then scheduling teachers in each team for common pupil-free time) flows from having elective as well as core teachers.

During the July 1 stakeholder meeting, we asked how schools and districts used the pupil-free time available through funding for elective teachers. The educators present at that meeting indicated there are many different approaches for identifying and using time for planning and collaboration. At the elementary level our recommendations suggest at least 60 minutes of pupil-free time for teachers, however, several participants indicated this level of pupil-free time was not available at their school. Consequently it is likely they have fewer opportunities to engage in collaborative teacher work and miss a key element of what it takes to move the student achievement needle. Teachers provided the daily 60 minutes of pupil-free time have more opportunities for such collaborative work.

Middle and high schools also presented many different schedules and time allotments for collaborative teacher work. Some schools were organized on a seven period day with teachers providing instruction for five periods. As compared to the Legislative Model, this requires 40% elective teachers over core teachers, not the 20% for middle schools and 33.33% for high schools in the EB Model, or the 33.0% in the Legislative Model, and as a result is more costly to implement. Other participants indicated their schools were organized in a block schedule, as the Legislative Model provides, and teachers in those schools had two 45 minute pupil-free blocks every day. Those time blocks could be used for a range of combinations of collaborative teacher team work and individual planning time. Some respondents indicated their high schools have a seven period day, but require teachers to teach for six of those periods, providing only one period (45-55 minute) a day of pupil-free time.

Stakeholder participants indicated considerable differences in how strongly teachers were encouraged or required to use pupil-free time for collaborative teacher work versus individual planning and preparation.

A reasonable goal for a funding formula, and for organizing schools and providing instruction, is to create three to five pupil-free time periods a week to allow teachers to engage in collaborative teacher work. The Wyoming funding system does an excellent job of providing resources allowing for this to happen, but the variation identified by the stakeholders suggests more progress can be made by school districts in ensuring collaborative teacher work is a part of the instructional practice.

Ensuring this kind of pupil-free time is provided and used for collaborative teacher work in Wyoming, however, appears to be an easier task than it might be in other states. In most states where we have worked, the teacher work-day is closer to six and half hours. The instructional day comprises six of those hours, and the additional 30 minutes is for lunch. To find pupil-free time during the six hours of instruction usually requires some sort of a block schedule or the use of time traditionally used for individual planning and preparation. Most of Wyoming's schools have a seven or eight period day, and use some of that extra time for teacher collaborative work. The longer day gives districts and teachers more options for finding time for collaborative during the regular work day but outside of the six hours of instruction.

The bottom line is that the Legislative Model and the EB Model provide sufficient elective staffing to allow all districts to provide teachers with three to five 45 minute pupil-free time periods during the week to (and we would argue should) be used for collaborative teacher work. Collaborative teacher work is a key factor in moving the student achievement needle both in Wyoming and across the country. While many districts and schools now provide for one to two of those time periods a week, it probably is time to expand the number of those collaborative work periods – as we would argue, the more teachers work in collaborative teacher teams, the more students learn and the more the student achievement gaps decline.

There is one minor additional item to consider. The EB Model allocates elective teachers at 33 1/3% of core teachers for high schools. At present, the Legislative Model uses 33% in its computations for both middle and high school. If the 33 1/3% were used for the Legislative Model, an estimated four more teacher FTEs would be generated, costing approximately $306,976.

2015 EB Recommendation: Provide 33 1/3 % elective/specialist teachers over core for high schools and 20% for elementary and middle schools.

5. Additional Vocational/Career Technical Education (CTE) Teachers

The Legislative Model provides additional staffing to school districts for vocational/CTE educational programs. The table below summarizes the current status of Vocational/CTE funding.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
No additional vocational education teachers resourced.	Apply an additional weighting factor of 29% to vocational education (CTE) student FTEs. Based upon weighted student count, provide an additional teacher for every 21 students.	No additional vocational education teachers resourced.	-37.56 FTEs, ($2,919,741)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

The EB Model does not recommend any additional teachers for vocational education/CTE courses because our analyses of recommended class sizes for the new types of CTE courses – computer assisted design, other engineering options and the bio-tech and health tech programs – show the class size within the EB Model recommendations of 25 students or the Legislative Model of 21 students is adequate for these newer types of CTE.

Additional Analyses for the 2015 Recalibration

The 29% weight was developed in a MPR and Associates 2002 study of vocational education in Wyoming (Klein, et al., 2002). The 29% weight was calculated on the basis of finding that actual SY 2001-02 vocational education class sizes in Wyoming were about 13.0 students compared to the actual average class size for non-vocational education classes of 16.7 students. At that time the school finance funding formula provided a high school *staffing* ratio of one teacher for every 21 students. As noted in the above discussion of Model Elements 2 and 3 on core class sizes, the staffing ratio in place at the time of the MPR study included both core and specialist teachers. But during the 2005 recalibration, the staffing ratios of 16 for elementary grades and 21 for secondary grades were used as a core class size ratio and an additional 33% of teachers were added to middle and high school staffing for elective classes. The new staffing ratio at the high schools provided for a substantial increase in the number of high school teachers, and in our opinion, rendered the additional 29% weight for CTE students unnecessary. However, since the 2005 and 2010 recalibrations, the Legislature has continued to include the 29% weight in its funding formula. The additional weight provides an estimated 38 teacher positions state-wide using school year 2014-15 student enrollment in CTE courses. The cost of the 38 teacher positions is an estimated $3.05 million.

Participants in the July 1-2 Stakeholder meetings confirmed this finding but made a different argument for more traditional CTE classes. The Stakeholder representatives said more traditional CTE course class sizes for such classes as woodworking, machining, welding and auto-mechanics should be smaller and the 29% weight should be retained. The rationale was two-fold. One was that safety issues and capital requirements for these classes required fewer than 21 students in a class. The second was such jobs were available in Wyoming and the classes provided training for students to obtain those jobs.

A larger framework, however, should be used to assess the latter argument about providing state aid for specific jobs. According to the CTE and vocational education communities, it is not wise to only prepare an individual for a specific job, whether it is welding or computer assisted design. Economies change and specific jobs come and go. Thus, as stated in the introduction to the 2007 proposed Wyoming CTE strategic plan (Hoachlander, Klein & Studier, 2007):

> Realizing the potential of CTE to contribute to students' mastery of both academic and technical knowledge depends not only on strengthening the CTE [Vocational Education] curriculum, but also on embedding CTE [Vocational Education] in a larger program combining core academics with applied learning. It is a plan focused on preparing students for postsecondary education and career, both options and not just one or the other.
>
> This plan calls for breaking down the rigid separation between academic and technical instruction in high school to capitalize on students' curiosity about the workings of the modern world. And it builds on this interest to deepen their understanding of core concepts in mathematics, science, English, and social studies. Expanding upon the traditional goal of vocational education—to prepare students for employment in specific occupations—the plan calls for providing workforce preparation in broader programs, organized around major career clusters that, in their entirety, comprise the major components of the modern economy. Offering practical preparation for employment in a wide range of careers, these programs by necessity stress mastery of core academic knowledge. But they also emphasize cross-disciplinary problem solving and are intended to expand students' understanding of technology and emerging fields, an industry's role in the larger political economy, critical features of public policy and governmental relations, essential environmental and safety issues, and ethical and social concerns.

The core idea is that neither newer CTE courses nor more traditional CTE courses should be focused just on specific jobs. Rather, such courses should be embedded within a broader course of studies so in the event a specific job declines or is no longer needed, students will have a broader set of skills qualifying them for a different job.

Thus, the policy issue in resolving the question is whether the State wants to continue supporting more traditional CTE courses with lower class sizes. Absent a clear way to make this distinction in the funding formula, this decision would also result in smaller class sizes for the newer CTE classes – which research suggests is not needed. As described above, the growing trend in CTE offerings generally is to prepare students for work in the new economy, not to give them traditional individual job skills. As a result, our conclusion is the 29% weight is not necessary to fully fund a strong CTE program. Stakeholders at the July meetings generally agreed with us, and in those few cases where for safety reasons districts feel they need classes smaller than 21, our sense is that there is enough flexibility in allocation of teaching resources across a high school to make that possible. Another important component of CTE courses today is to support STEM programs. There are clearly multiple links between STEM and the curricula of newer (and even traditional) CTE courses. We expect there will be more information on how this can be done once the State has gone further in its work to increase the number of STEM programs.

The WDE provided additional information[5] related to CTE class sizes at the September 3-4 meeting of the Select Committee on School Finance recalibration. For SY 2014-15, using October 1, 2014 enrollment data, there were 2,486 CTE class sections. The class sizes ranged between one and 42 students. Ninety percent of the CTE sections had class sizes of 19 students or less.

We have not been able to find a credible reference or source to support or rebut the 29% weight. Further, as cited above, since overall high school staffing was increased by 33% after the weight was introduced, it could be argued the increase eliminated the need for the weight. Consequently, we continue to conclude the 29% weight is not necessary.

2015 EB Recommendation: No additional vocational education teachers need to be resourced; eliminate the 29% weight for CTE students providing for additional teacher resources from the Legislative Model.

6. Minimum Teacher and Staff Resources

As mentioned above, one important issue is how to staff schools with enrollments smaller than the smallest school prototypes – 96 elementary students and 105 middle and high school students. Under the Legislative Model (and the recommendations of the 2010 EB Model) schools with 49 or fewer students are provided one assistant principal position and one teacher for every seven students. The Models then specified different numbers of minimum teachers for schools with more than 49 students but fewer than the smallest prototypes. The 2015 EB Model recommendations offer a new simplified approach to providing resources to schools with enrollments between 49 students and the smallest school prototypes. This new approach was developed through extensive consultation with representatives of the four small school districts and the Select Committee on School Finance Recalibration. This new approach established several goals:

[5] WDE information related to CTE courses can be found at the following hyperlink: http://legisweb.state.wy.us/InterimCommittee/2015/SSRRpt0903AppendixT.pdf.

- The EB Model should be as simple as possible so it is easy to understand and can be accurately programmed;
- "Cliff effects" should be eliminated to the maximum extent possible;
- School grade organization of should not influence the resources generated (i.e. K-5, K-6, K-8, K-12, 6-12, 7-12, etc.); and
- We should remain cognizant of the relatively small impact changes in the approach to small schools has on total EB Model resources and at the same time be aware of the potential for large revenue shifts for individual small districts.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Minimum Teachers Elementary Schools: a minimum of 3.65 teachers provided for elementary schools with ADM greater than 49. Middle Schools: a minimum of 7.0 teachers provided for middle schools with ADM greater than 49. High Schools: a minimum of 7.0 teachers provided for high schools with ADM greater than 49. Minimum teachers are resourced at the highest grade band level.	*Minimum Teachers* Elementary Schools: a minimum of 6.0 teachers provided for elementary school grade bands with ADM greater than 49. Middle Schools: a minimum of 8.0 teachers provided for middle school grade bands with ADM greater than 49. High Schools: a minimum of 10.0 teachers provided for high school grade bands with ADM greater than 49. For school grade bands of 49 and below, minimum teacher resources are provided on a prorated basis at 1.0 teacher for every 7 students with a minimum of 1.0 teacher. Additionally, there is a "Small District Adjustment," which provides districts with 243 or fewer ADM a minimum of one teacher at each school for every grade level ADM exists. *Minimum Staff (Small School Adjustment)* For elementary, middle and high schools of 49 ADM & below, minimum staff resources are provided on the basis 1.0 assistant principal and 1.0 teacher for	*Minimum Teachers* Elementary Schools: a minimum of 7.0 teachers provided for elementary school grade bands with ADM greater than 49. Middle Schools: a minimum of 7.0 teachers provided for middle school grade bands with ADM greater than 49. High Schools: a minimum of 7.0 teachers provided for high school grade bands with ADM greater than 49. For school grade bands of 49 & below, minimum teacher resources are provided on a prorated basis at 1 teacher for every 7 students, with a minimum of 1.0 teacher position. *Non-Teacher Staff Resources* For schools with ADM less than the highest grade band's one-section school, provide 1.0 assistant principal position and other non-teacher staff elements are resourced based on total school ADM at the highest grade band and prorated down from a one-section school for all schools, where identified. Additionally, resources	*Minimum Teachers:* -34.64 FTEs, ($2,686,814) *Small District Teachers:* -15.99 FTEs, ($1,236,104) *Non-Teacher Staff Resources:* 40 Assistant Principal FTEs, $3,907,761

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
	every 7.0 ADM, with a minimum of 1.0 teacher.	generated by the at-risk and ELL student counts are provided for all schools.	

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

In the 2005 and 2010 recalibrations, for schools with fewer than 96 students at the elementary level, and 105 students in middle and high schools, it was recommended non-teacher staffing resources be simply prorated down from the staffing of a one section school to a small school designation of 49 students. Minimum teachers would be resourced at the highest grade band for schools at rate of 3.65 in elementary schools and seven teachers for secondary schools. For schools below 49 students, staffing resources provided to schools were one assistant principal position plus one teacher for every seven students. In the 2005 recalibration it was argued, particularly for elementary schools, this provided sufficient staffing if schools organized classrooms with students of different ages. For elementary schools, it was even argued that multi-age classrooms could be a more effective way to organize classrooms (for example, see Decotis & Tanner, 1995; Gutierrrez and Slavin, 1992; Slavin, 1987; & Pavan, 1992).

In response to the recommendation, the Wyoming education community preferred to have more teachers for schools with more than 49 students. The Legislature agreed and the Legislative Model provides for minimum teacher allocations that exceed the recommendations of the EB Model. The Legislative Model provides each elementary grade band a minimum of six teachers, middle school grade bands eight teachers and high school grade bands a minimum of 10 teachers.

In addition to providing a minimum number of teachers at each school, the Legislative Model was revised during the 2010 recalibration, to include a “small district adjustment” which provides school districts with 243 or fewer ADM a minimum of one teacher at each school for every grade level ADM exists at that school.

Resource Use Analysis

The number of teachers employed as compared to the Legislative Model for small schools (49 or fewer students) can be found in Tables 3.2 and 3.9 for elementary and secondary schools, respectively. It is difficult to compare the teachers employed to the teachers generated for small schools because the formula generates one teacher for every seven students to provide resources for all staff. The actual allocation of staff will differ greatly. The intent of the small school formula, one assistant principal plus one teacher for every seven students was to provide enough resources to staff the school with a variety of staff as decided by the school and district. The 2015 EB Model recommendation will make this comparison easier.

Additional Analyses for the 2015 Recalibration

Under the Legislative Model – as well as the 2010 EB Model recommendation – there is the potential for substantial revenue shifts as districts move between the minimum staffing provided for schools with ADM between 50 and either 96 (elementary) or 105 (middle and high school), and the minimum allocations for schools with 49 or fewer students. There are additional potential substantial revenue shifts in the Legislative Model for districts if the total district ADM moves above 243 ADM, the current small district cut-off, for which there is not a similar adjustment in the EB Model. In assessing several different scenarios for several small schools, we concluded cliff effects were hard to estimate because school district revenues for schools with more than 49 students were dependent on multiple factors, establishing different answers to the size of a cliff effect depending on each school/district characteristic. The challenge is further complicated by the existence of multiple minimum staffing requirements in the Legislative Model.

Because of the multiple complications of developing a recommendation that meets the needs of all schools and districts, we initially attempted to establish a formula that considered all revenues for school districts under both the small school formula (one assistant principal and one teacher per seven students) and the formula for schools larger 49 students. We concluded that depending on the actual characteristics of school ADM, a convergence of revenues occurred at about 49 students for elementary schools and 56 students for middle and high schools. However, this convergence formula was complex and can change on a school basis depending on the characteristics of a very few children, leading to potential cliff effects.

We were also cognizant of another change in the funding environment in Wyoming. When we developed the initial EB Model in 2005, there had been considerable discussion about what constituted a "school," and we followed previous practice to design a model that did not establish incentives for school districts to define buildings, such as a K-12 school, as multiple schools within the building so districts could maximize revenues.

During the July 2015 stakeholder meeting in Cody, Wyoming we discovered the WDE works with small school districts – which often have small K-12 schools – to help them identify the best way to maximize their total revenue by establishing different grade bands and configuring their schools to maximizes revenues. Given this changed approach, we developed a new minimum teacher formula to simplify computations and should eliminate most, if not all potential cliff effects.

The key to the 2015 EB Model recommendation is the adjustment for schools below 49 students is only applied to the number of teachers in the school; all other staff resources are generated based on the total ADM of the school, regardless of the total. Dollars per student resources are not affected by this recommendation. The new approach relies on a three-step process:

Step 1: All school level staff resources are provided based on the total ADM of the school, except school administration and guidance counselors. This includes instructional facilitators, counselors, nurses, core tutors, supervisory aides, librarians and library aides, school computer technicians and school secretarial and clerical staff. These resources are generated based on the highest grade band enrolled in the school, and prorated down from the allocation of those resources for the smallest school prototypes (96 for elementary and 105 for middle and high schools). For schools with fewer ADM than a one-section school for the highest grade band, the principal position is replaced by an assistant principal position that is provided to the building for any ADM below a one unit school. This resolves the issue of prorating a principal between 50 ADM and a one-section school, and any reverse cliff effects that might occur as funding changes from a portion of a principal to a full time assistant principal. For guidance counselors, the formula provides one counselor for every 288 elementary ADM and one counselor for every 250 middle and high school ADM, regardless of school size.

Step 2: Teacher resources are provided based on grade bands (elementary, middle and high). Any grade band with 49 or fewer ADM receives teachers on the basis of one teacher per seven ADM, with a minimum of one teacher. Above 49 ADM a grade band receives a minimum of seven teachers. Under this scenario, a K-12 school with more than 49 students in each grade band would receive a minimum of 21 teachers. The minimum of seven would remain in place until the formula provides more than seven teachers (core and specialist). At a minimum of seven, this occurs at 101 students in an elementary grade band, 158 students in a middle school grade band, and 131 in a high school grade band. Further, under this scenario, if the Legislature chooses to do so, it can raise the minimum teacher allocations in any or all of the grade bands, and the change is simple to make in the formula, and it does not impact the allocation of other school resources, although it will have the potential to create a cliff effect at an ADM of 49 in any grade band.

Step 3: Resources for struggling students are provided to the school using the parameters of the Model using at-risk and ELL student counts regardless of the school's size – above and below 49 students. Schools will generate resources for at-risk tutors, ELL teachers, at-risk pupil support and summer school and extended day programs for each of the at-risk and ELL counts within the school.

2015 Evidence-Based recommendation: Resource minimum teachers separately from all other staff allocations in small schools. In a school, for grade bands with 49 or fewer students, provide one teacher per seven ADM, with a minimum of one teacher. For grade bands in a school with more than 49 students provide a minimum of seven teachers per grade band, until the total teachers generated by the formula exceed seven, then use the Model parameters. For all other school level staff resources identified in Step 1, funding is based on the total school ADM and prorated down from the smallest school prototypes. In Step 3, staff to support struggling students is resourced for all schools, regardless of size, using ELL and at-risk student counts. For schools with fewer ADM than the smallest school prototypes for the highest grade band, the principal position is replaced by an assistant principal position which is provided to the building for any ADM below the smallest school prototype ADM; this resolves the issue of prorating a principal between 50 ADM and the ADM of the smallest school prototypes (96 elementary, and 105 middle and high school). For guidance counselors, the formula provides one counselor for every 288 elementary ADM and one counselor for every 250 middle and high school ADM, regardless of school size.

7. Instructional Facilitators/Coaches

Instructional coaches, or instructional facilitators, coordinate the instructional program but most importantly provide the critical ongoing instructional coaching and mentoring the professional development literature shows is necessary for teachers to improve their instructional practice (Cornett & Knight, 2008; Crow, 2011; Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Calhoun, 1996; Joyce & Showers, 2002). This means the instructional facilitators spend the bulk of their time with teachers, modeling lessons, giving feedback to teachers, working with teacher collaborative teams, and generally helping to improve the instructional program. The few instructional coaches who also function as school technology coordinators provide the technological expertise to fix small problems with the computer system, install software, connect computer equipment so it can be used for both instructional and management purposes, and provide professional development to embed computer technologies into a school's curriculum. This report expands on the rationale for these individuals in the section on professional development (Element 16), but includes them here as they represent teacher positions.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 1.5 instructional facilitator/coaches for prototypical elementary (288 ADM) and secondary (315 ADM) schools at the highest grade band level. Fund as a categorical grant.	Resourced equal to 60% of the 2010 Evidence-Based recommendation. Funded as a categorical grant.	Provide 1.5 instructional facilitator/coaches for prototypical elementary (288 ADM) and secondary (315 ADM) schools at the highest grade band level, with a minimum of 1.0 instructional facilitator position for each school district. Fund as a categorical grant.	193.78 FTEs, $15,030,357

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

A few states (i.e., Arkansas, New Jersey, Wyoming and to a modest degree North Dakota) explicitly provide resources for school and classroom-based instructional coaches. Most comprehensive school designs (see Odden, 1997; Stringfield, Ross & Smith, 1996), and EB studies conducted in other states – Arizona, Arkansas, Kentucky, Maine, North Dakota, Washington and Wisconsin – call for school-based instructional facilitators.

Early research found strong effect sizes (1.25-2.71) for coaches as part of professional development (Joyce & Calhoun, 1996; Joyce & Showers, 2002). A 2010 evaluation of a Florida program that provided reading coaches for middle schools found positive impacts on student performance in reading (Lockwood, McCombs & Marsh, 2010). A related study found that coaches provided as part of a data-based decision making initiative also improved both teachers' instructional practice and student achievement (Marsh, McCombs & Martorell, 2010).

More importantly, a randomized controlled trial of coaching (Pianta, Allen & King, 2011) found significant, positive impacts in the form of student achievement gains across four subject areas – mathematics, science, history, and language arts. This research provides further support for this element as an effective strategy to boost student learning.

In terms of numbers of coaches, several comprehensive school designs suggest that although one instructional coach might be sufficient for the first year of implementation of a school-wide program, additional instructional coaches are needed in subsequent years. Moreover, several technology-heavy school designs recommend a full-time instructional facilitator who spends at least half of their time as the site's technology expert. Thus, drawing from all programs, we conclude that 1.0 FTE instructional coaches are needed for every 200 students in a school. This resourcing strategy works for elementary as well as middle and high schools. In Wyoming, this recommendation equates to 1.5 instructional coaches for each prototypical elementary (288 students) and middle and high school (315 students).

Although instructional coaching positions are identified as FTE positions, schools could divide the responsibilities across several individual teachers. For example, the 3.0 positions in a 630-student high school could be structured with six half-time teachers and instructional coaches. In this example, each teacher/coach would work 50% time as a coach – perhaps in one curriculum area such as reading, math, science, social studies and technology – and 50% time as a classroom teacher or tutor.

We note this level of staffing for instructional coaches, combined with the additional elements of professional development discussed below, focus on making Tier 1 instruction (in the RTI framework) as effective as possible, providing a solid foundation of high quality instruction for everyone, including students who struggle more to learn to proficiency.

Resource Use Analysis

In 2013-14 the Legislative Model allocated a total of 266.5 instructional coach positions to Wyoming school districts. The districts employed 242.1 instructional coaches or 24.4 fewer than allocated. The WDE's CRERW report also shows expenditures of almost $2.2 million from general funds for instructional coaches in eight school districts.

Instructional coaches are a critical part of successful professional development for teachers. With the shift to college and career ready standards requiring substantial change in teachers' instructional practice, we recommend the Legislature needs to consider strategies to provide incentives for school districts to hire and use more instructional coaches. If schools are to boost the achievement curve, teachers' instructional practice must become more effective, a task aided by using more instructional coaches as recommended in the EB Model.

Additional Analyses for the 2015 Recalibration

During the 2015 recalibration process, questions were raised about how many instructional facilitators were hired from funds outside the Legislative Model (e.g., general funds, federal funds, etc.).[6] Table 3.11 identifies the total number of instructional facilitators FTEs hired, by funding source, since SY 2011-12. According to the data, about one-third of instructional facilitators are employed with federal funds, even though the State provides for more FTEs than are actually employed.

Table 3.11 Instructional Facilitator FTEs and Funding Sources

School Year	State Funded FTEs	Total Instructional Facilitator FTE	Instructional Facilitator FTE Federal Funded	Instructional Facilitator FTE State Funded	Instructional Facilitator FTE Other Funded
2011-12	259.3	279.07	125.03	91.04	63.00
2012-13	263.2	238.36	85.70	78.80	73.86
2013-14	266.5	242.07	82.27	75.13	84.67
2014-15	270.3	249.68	89.92	74.20	85.56

Source: WDE.

Additionally, the WDE provided analysis regarding compliance with the qualifications established by W.S. 21-13-335(b)(iv) to employ instructional facilitators with at least five years of classroom teaching experience and who hold a Master's degree or national certification by the National Board of Professional Teaching Standards. Table 3.12 provides the information at a statewide level, showing about 84% of instructional facilitators employed meet the requirements, and it differs based upon the funding source.

[6] The WDE did not start collecting funding source data until SY 2011-12, thus information prior to then is not available.

Table 3.12 Percent of Instructional Facilitator FTEs Meeting Employment Statutory Requirements.

School Year	% All IFs Meeting Statutory Requirements	% Federally Funded IFs Meeting Statutory Requirements	% State Funded IFs Meeting Statutory Requirements	% Other Funded IFs Meeting Statutory Requirements
2011-12	74.7%	78.2%	69.1%	75.9%
2012-13	78.4%	77.9%	73.8%	83.9%
2013-14	81.2%	84.2%	73.4%	85.4%
2014-15	83.7%	87.2%	77.9%	85.1%

Source: WDE.

Participants in the July 1 stakeholder meeting lauded the State for providing IFs, and believed they were crucial to their school improvement processes. They described how instructional facilitators worked with collaborative teacher teams, helped them analyze student data and tease out the implications for instruction, provided extra help for new teachers, modeled effective instructional strategies, and otherwise worked with teachers to continuously improve the instructional program. Some participants stated instructional facilitators were the backbone of their professional development systems, serving as the instructional leaders in schools, providing ongoing differential professional development to teachers, and helping to produce a culture of continuous instructional improvement. Other participants stated instructional facilitators were crucial to the successful functioning of teacher collaborative teams, working with the teams to interpret student data for their implications for instructional practice.

Participants also praised the State instructional facilitators task force created after the 2005 recalibration. The task force was created to:

- Help train instructional facilitators,
- Identify the skills and competencies needed to be an effective instructional facilitator,
- Propose selection criteria for instructional facilitators, and
- Identify the major work tasks of instructional facilitators.

The stakeholders at the meeting suggested this statewide initiative helped create the current statewide cadre of instructional facilitators, and was important in ensuring instructional facilitators are effective in their work.

The participants at the stakeholder session had universal support for increasing funding for instructional facilitators from the current 60% of the EB Model recommendations to 100%. There was also strong support for maintaining the categorical grant program approach used rather than rolling the funding into the block-grant. In other states where funding for instructional facilitators is part of a block-grant, there is evidence a portion of those resources have been used for alternative purposes. Keeping the instructional facilitator funding as a categorical program would ensure this would not happen in Wyoming. If the Legislative Model fully funded the instructional facilitator program, and districts funded instructional facilitators only with State instructional facilitator dollars, districts could redistribute other funds they are now using for instructional facilitators to other important areas, such as more Tier 2 extra help for struggling students

A representative from one small district suggested each district should receive a minimum of 1.0 instructional facilitator position; we agree with this suggestion and modified our 2015 EB Model recommendation. This would only impact an estimated four school districts resulting in 1.8 additional FTEs statewide if the instructional facilitators were funded 100% as recommended by the EB Model.

2015 Evidence-Based recommendation: Provide funding for instructional facilitators at the rate of 1.5 positions for each prototypical elementary, middle and high school, resourced at the highest grade band level, with a minimum of one instructional facilitator for each school district. Continue to fund as a categorical grant program outside of the block grant.

8. Core Tutors/Tier 2 Intervention

The most powerful and effective approach for helping students struggling to meet state standards is individual one-to-one or small group (1:3 or 1:5 maximum) tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). In our 2005 and 2010 recalibration reports we recommended allocation of tutors to schools on the basis of the number of at-risk students, with a minimum of one tutor position. Since then, we have recognized all schools, even those with no at-risk students (as measured by ELL, free and reduced lunch eligible and mobility) have struggling students that need Tier 2 resources. Thus, we have modified the 2015 EB Model to resource each prototypical school at least one *core* tutor position based upon school ADM and additional *at-risk* tutors based upon the at-risk count (Element 26).

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide a minimum of 1.0 tutor position for each prototypical school, resourced at the highest grade band level, <u>less</u> tutor positions provided on basis of at-risk student count (1.0 tutor position for every 100 at-risk students).	Provide a minimum of 1.0 tutor position for each prototypical school, resourced at the highest grade band level, <u>less</u> tutor positions provided on basis of at-risk student count (1.0 tutor position for every 100 at-risk students).	Provide 1.0 core tutor position for each prototypical school (288 ADM elementary school and 315 ADM middle or high school), resourced at the highest grade-band level.	Total: 288.64 Core Tutor FTEs, $22,389,965 *Note: Net increase in total tutors of 225.28 FTEs, $17,476,819 when accounting for both Core (Element 8) and At-Risk tutors (Element 26).*

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

The most powerful and effective extra help strategy to enable struggling students to meet state college and career ready standards is individual one-to-one tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). Students who must work harder and need more assistance to achieve to proficiency levels especially benefit from preventative tutoring (Cohen, Kulik, & Kulik, 1982). Tutoring program effect sizes vary by the components of the approach used, e.g. the nature and structure of the tutoring program, but effect sizes on student learning reported in meta-analyses range from 0.4 to 2.5 (Cohen, Kulik & Kulik, 1982. Shanahan, 1998; Shanahan & Barr, 1995; Wasik & Slavin, 1993) with an average of about 0.75 (Wasik & Slavin, 1993).

The impact of tutoring programs depends on how they are staffed and organized, their relation to the core program, and tutoring intensity. Researchers (Cohen, Kulik, & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) have found greater effects when the tutoring includes the following:

- Professional teachers as tutors;
- Tutoring initially provided to students on a one-to-one basis;
- Tutors trained in specific tutoring strategies;
- Tutoring tightly aligned to the regular curriculum and to the specific learning challenges, with appropriate content specific scaffolding and modeling;
- Sufficient time for the tutoring; and
- Highly structured programming, both substantively and organizationally.

We note several specific structural features of effective one-to-one tutoring programs:

- First, each tutor would tutor one student every 20 minutes, or three students per hour. This would allow one tutor position to tutor 18 students a day. (Since tutoring is such an intensive activity, individual teachers might spend only half of their time tutoring; but a 1.0 FTE tutoring position would allow 18 students per day to receive 1:1 tutoring.). Four positions would allow 72 students to receive individual tutoring daily.
- Second, most students do not require tutoring all year long; tutoring programs generally assess students quarterly and change tutoring arrangements. With modest changes, close to half the student body of a 400-student school could receive individual tutoring during the year.
- Third, not all students who are from a low-income background require individual tutoring, so a portion of the allocation could be used for students in the school who might not be from a lower income family, but nevertheless have a learning issue that could be remedied by tutoring. This also is part of the rationale for including one tutor in each prototypical school, regardless of the number of at-risk students.

Though this discussion focuses on *individual* tutoring, schools could also deploy these resources for small group tutoring. In a detailed review of the evidence on how to structure a variety of early intervention supports to prevent reading failure, Torgeson (2004) shows how one-to-one tutoring, one-to-three tutoring, and one-to-five small group sessions (all Tier 2 interventions) can be combined for different students to enhance their chances of learning to read successfully.

One-to-one tutoring would be reserved for the students with the most severe reading difficulties, scoring at or below the 20th or 25th percentile on a norm referenced test, or at the below basic level on state assessments. Intensive instruction for groups of three-to-five students would then be provided for students above those levels but below the proficiency level.

It is important to note that the instruction for all student groups needing extra help needs to be more explicit and sequenced than that for other students. Young children with weakness in knowledge of letters, letter sound relationships and phonemic awareness need explicit and systematic instruction to help them first decode and then learn to read and comprehend. As Torgeson (2004:12) states:

> Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own. For example, explicit instruction requires teachers to directly make connections between letters in print and the sounds of words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group

> of high at-risk children in kindergarten, first grade and second grade …..only the most [phonemically] explicit intervention produced a reliable increase in the growth of word-reading ability … schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire work-reading skills at grade level by the third grade …. Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text…. Finally, it requires not only direct practice to build fluency…. but also careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning.

Torgeson (2004) goes on to state meta-analyses consistently show the positive effects of reducing reading group size (Elbaum, Vaughn, Hughes & Moody, 1999) and identifies experiments with both one-to-three and one-to-five teacher-student groupings. Though one-to-one tutoring works with 20 minutes of tutoring per student, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes. The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, a one reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group, and 30+ students a day in the one-to-five setting with 45 minutes of instruction per group. Four tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though we have emphasized one to one tutoring, and some students need one to one tutoring, other small group practices (which characterize the bulk of Tier 2 interventions) can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) states similar interventions can work with middle and high school students, the effect often is smaller as it is much more difficult to undo the lasting damage of not learning to read when students enter middle and high schools with severe reading deficiencies. However, a new randomized control study, (Cook et al., 2014) discussed next, found similarly positive impacts of a tutoring program for adolescents in high poverty schools if it was combined with counseling as well. This is made possible in the EB Model as it includes such additional non-academic pupil support resources (see Element 27 discussion).

The rationale outlined above is strengthened by two recent randomized controlled trials of the effectiveness of tutoring for struggling students, which support our logic for providing a minimum level of tutor support in all schools as well as additional tutors for schools with greater need. At the elementary level, May et al., (2013), using a randomized controlled trial, assessed the impact of tutors in a Reading Recovery program. In the third year of a five-year evaluation, they found Reading Recovery tutoring had an effect size of 0.68 on overall reading scores relative to the population of students eligible for such services in the specific study, and a 0.47 effective size relative to the national population of first grade struggling readers. The effects were similarly large for reading words and reading comprehension sub-scales.

For students in high schools, Cook, et al. (2014) reported on a randomized controlled trial of a two-pronged intervention that provided disadvantaged youth with tutoring and counseling. They found intensive individualized academic extra help – tutoring – combined with non-academic supports seeking to teach grade 9 and 10 youth social-cognitive skills based on the principles of cognitive behavioral therapy, led to improved math and reading performance. The study sample consisted mainly of students from low income and minority backgrounds, which generally pose the toughest challenges. The effect size for math was 0.65 and for reading was 0.48; the combined program also appeared to increase high school graduation by 14 percentage points (a 40% hike). The authors concluded this intervention seemed to yield larger gains in adolescent outcomes per dollar spent than many other intervention strategies.

These studies are highlighted for several reasons. First, they represent new, randomized controlled trials, supporting the efficacy of tutoring. Second, they show tutoring can work not only for elementary but also for high school students, whereas most of the tutoring research addresses elementary-aged students. Third, they show tutoring can work even in the most challenging educational environments. Lastly, they bolster the EB Model recommendation below that extra help resources in schools triggered by poverty/at-risk status should also include some non-academic, counseling resources as well, as the treatment in the second study was tutoring combined with counseling.

In our 2005 and 2010 recalibration reports, we recommended a minimum of one tutor position for each prototypical school less tutor positions provided on the basis of at-risk student counts. The recommended ratio was a minimum of one tutor position for each prototypical school (288 elementary students and 315 middle and high school students) less the tutor positions resourced based upon one tutor position for every 100 at-risk students. As a result, a school without any at-risk students would receive the minimum of one tutor position based upon the school's ADM, but a school with 100 at-risk students would receive the same single tutor, even though it might have more need for tutor resources. Today educators and policymakers across the country argue that schools with few low-income students still have students who struggle to learn to proficiency, and that more rigorous college and career ready standards will lead to greater numbers of struggling students in the future. We find those arguments convincing and have modified the EB recommendations for tutoring resources.
The revised EB Model provides one *core* tutor/Tier 2 intervention position in each prototypical school. In parallel with that change, the EB Model adjusts the ratio for additional at-risk tutor positions to one position for every 125 at-risk students. The additional support beyond the first tutor per prototypical school is discussed again in Element 26 below. The new EB Model recommendation for *core* tutor/Tier 2 intervention positions is more generous than the previous recommendation.

Resource Use Analysis

Wyoming school districts do not employ tutors in nearly the numbers generated through the Legislative Model. In SY 2013-14, the Legislative Model generated 380.1 tutor positions, while districts employed 131.0 tutors or 249.1 fewer than funded. Two of the districts employ more tutors than allocated, while the remaining 46 employ fewer tutors.

The count of tutors is confounded somewhat by the fact that districts also report a position called "teachers not of record" to the WDE and some districts may be reporting some tutors in that category. A total of 73.3 teachers are reported in this category, and if it were assumed all of them were serving in the role of tutor (an unlikely occurrence), then six more districts (for a total of eight) would employ more tutors than allocated, and 39 would employ fewer tutors. Even then, the Legislative Model would generate 175.8 more tutors statewide than are employed.

This analysis demonstrates school district practices with respect to tutors is not aligned with the Legislative Model. Since extra help for struggling students is critical to educate all students to proficient or higher performance levels, the resources for such extra help should be fully utilized. During the 2015 recalibration, the Legislature should consider incentives for districts to provide struggling students extra help. Holding performance standards constant and varying instructional time is a key strategy for ensuring all students are able to meet higher standards.

2015 Evidence-Based recommendation: Provide 1.0 core tutor position for each prototypical school (288 ADM elementary school and 315 ADM middle or high school), resourced at the highest grade-band level.

9. Substitute Teachers

Schools need some level of support for substitute teachers to cover classrooms when teachers are sick for short periods of time, absent for other reasons, or on long-term leave. In many other states, substitute funds are budgeted at a rate of about 10 days per teacher. The 2015 EB Model recommendation provides the same, with minor revisions from prior recommendations.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide for 5% (8.75 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches and teacher positions for summer school and extended day. Resourced at a daily salary equal to $99.25 (inflated to $102.97) plus 7.65% for social security and Medicare benefits ($110.85). Substitute resources provided for small schools.	Provide for 5% (8.75 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches and teacher positions for summer school and extended day. Resourced at a daily salary equal to $102.97 plus 7.65% for social security and Medicare benefits ($110.85). Substitute resources provided for small schools.	Provide for 5.715% (10 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches and teacher positions for summer school and extended day. Resourced at a daily salary equal to $102.97 plus 7.65% for social security and Medicare benefits ($110.85). Daily salary adjusted by regional cost adjustment.	Total: $918,511 *Note: Since this component is variable based on the number of teachers, tutors, IFs, summer school and extended-day teachers, the estimated cost difference will fluctuate if any of those components are changed.*

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

During the 2005 and 2010 recalibrations we recommended 10 days of substitute teacher resources for each teacher, which assumed a teacher work year of 200 days or 5%. This approach does not mean each teacher is provided 10 substitute days a year; it means the district receives a “pot” of money approximately equal to 10 substitute days per year for all teachers, in order to cover classrooms when teachers are absent for reasons other than professional development. Professional development recommendations are fully developed in a separate section below (Element 13).

Resource Use Analysis

The Legislative Model allocated approximately $6.7 million to school districts for substitutes in school year 2012-13. Data on actual district expenditures for substitute teachers are not collected by the WDE so it is not possible to provide information on how those resources are utilized.

Additional Analysis for the 2015 Recalibration

The 2010 EB Model and Legislative Model provide substitute positions generated equal to 5% of all teachers, including core and elective teachers, tutors, ELL teachers, instructional facilitators or coaches, and teachers for extended day and summer school programs for all schools. The substitute positions are then multiplied by the number of instructional days, for the Legislative Model this is 175 days, and then multiplied by the compensation amount.

School district substitute expenditures reported to the WDE cannot isolate overall expenditures for substitute teachers. Several school districts, however, claim their substitute teacher expenditures exceed the revenues provided by the Legislative Model. From numerous discussions, it seems a major reason stems from substitute teacher expenses related to student activities for coaches to support athletic events in the district and when coaches travel with athletic teams. Since coaches miss academic classes, districts code the substitute teacher expenditures to the instructional budget category rather than the student activities budget. The costs of substitutes for student activities will be addressed in the Element 21.

There are three issues to address in assessing substitute teacher resources: the number of days provided for substitute teachers, the compensation amount and whether to apply the RCA to the daily substitute rate, as recommended by the Wyoming Association of School Business Officials (WASBO).

Number of Days of Substitute Time

Many states provide substitute teacher resources for about 10 days for each teacher, which is similar to many companies and governments that provide one sick day per month for employees. Since teachers work about ten months, the number of sick days is reduced from 12 to 10. The EB Model assumes the average teacher work year is 200 days: 180 days of instruction, 10 days of professional development, and 10 days for opening and closing schools and parent conferences.

The Legislative Model provides substitute pay for only 8.75 days, which represents 5% of 175 instructional days rather than the number of days in teacher contracts that range from 180 to 190 days. During this recalibration process WASBO has recommended increasing the number of substitute days to 13.13 days, which represents 7.5% of the 175 days. WASBO offered this recommendation because of the substantial number of substitute days districts use to allow teachers to coach student activities as discussed above. However, there is no data to identify how many days teachers are absent due to student activities. The EB Model assumes substitute costs for student activities are resourced in the student activities element and should not be part of the resources for substitutes for replacing teachers during instructional time.

To reach the EB Model suggested rate of 10 substitute days for each teacher, we recommend the Legislative Model be recalibrated to provide 5.715% of teacher days, assuming 175 instructional days in a teacher contract, rather than the current 5%.

Substitute Daily Compensation Rate

One way to assess the adequacy of the current Wyoming approach to funding substitute teacher costs is to view the daily rate in the Legislative Model compared to the daily substitute rates provided by school districts. Table 3.13 shows daily substitute rates for all 48 districts over a nine-year time period beginning with SY 2006-07. Some cells are empty because the rates were not included in the source from which the data were taken. The data show that in any one year several districts had substitute rates lower than what the Legislative Model provided, while several other districts had rates that were higher, though the differences are not dramatic. There does not appear to be a systematic pattern for substitute rates higher or lower than the Legislative Model. The goal of the substitute teacher element is to provide enough resources that districts can tap to pay substitute teachers. Our conclusion is the current rate of $102.97 plus 7.65% for benefits is adequate for SY 2016-17 and should continue to be adjusted by an ECA in the future as determined by the Legislature.

Table 3.13 Wyoming School District Daily Salary for Substitutes of Certified Staff

	School Year (Model Daily Rate)								
School District	2006-07 ($88.40)	2007-08 ($91.76)	2008-09 ($95.70)	2009-10 ($99.25)	2010-11 ($99.25)	2011-12 ($99.25)	2012-13 ($99.25)	2013-14 ($99.25)	2014-15 ($100.28)
Albany #1	$89	$85	$95	$98	$103	$103	$102	$102	$105
Big Horn #1	$80	$85	$85	$96	$96	$96	$96	$96	$102
Big Horn #2	$88	$88	$90	$95	$98	$98	$98		
Big Horn #3	$80	$80	$80	$92	$100	$100	$100	$100	$100
Big Horn #4		$85	$85	$85	$85	$85	$100	$100	$100
Campbell #1	$90	$95	$95	$105	$105	$105	$105	$105	$105
Carbon #1	$75	$75	$85	$95	$95	$95	$95	$95	
Carbon #2	$83	$85	$85	$85	$92	$92	$92	$92	$92
Converse #1	$87	$82	$82	$94	$89	$93	$93	$93	$94
Converse #2	$75	$85	$85	$80		$81	$81	$105	$107
Crook #1	$88	$88	$88	$88	$88	$90	$110	$110	$115
Fremont # 1	$80	$80		$90	$90	$90	$92	$94	$100
Fremont # 2	$80	$80	$80	$80	$80	$88	$88	$88	$88
Fremont # 6	$75	$80	$90	$100	$100	$100	$100	$100	$105
Fremont #14	$81	$108	$118	$108		$100	$100	$100	$130
Fremont #21	$100	$110	$111	$113	$113	$117	$117	$126	$103
Fremont #24	$75	$85	$100	$100	$100	$100	$100	$100	$110
Fremont #25		$80	$80		$80	$80	$90	$90	$90
Fremont #38	$100	$11	$100	$100	$100	$100	$100		$110
Goshen #1	$75	$85	$90	$100	$100	$100	$100	$100	$100
Hot Springs #1	$85	$85	$85	$85	$85	$85	$85		$85
Johnson #1	$88	$88	$88	$88	$88	$88	$88	$88	$88
Laramie #1	$100	$100	$105	$105	$105	$107	$108	$111	$114
Laramie #2	$90	$90	$100	$105	$105	$111	$111	$112	$115
Lincoln #1	$77	$105		$105	$105	$105	$105	$105	$105
Lincoln #2	$85	$90	$110	$110	$110	$90	$90	$90	$108
Natrona #1	$90	$90	$100	$100	$100	$100	$100	$100	$110
Niobrara #1	$80	$80	$80	$80	$80	$80	$80	$80	$80
Park # 1	$85	$97	$96	$108	$108	$100	$100	$100	$106
Park # 6	$85	$85	$100	$100	$100	$100	$100	$100	$100
Park #16	$75		$93	$93	$93	$93	$93		
Platte #1	$70	$68	$75	$75	$80	$75	$75	$75	$75
Platte #2	$86	$97	$97	$97	$97	$90	$90	$90	$90
Sheridan #1		$99	$102	$104	$106	$106	$106		
Sheridan #2	$86	$90	$90	$92	$92	$92	$94	$94	$94
Sheridan #3	$90	$90	$90	$90	$90	$90	$90		
Sublette #1	$100	$105	$110	$120	$120	$120	$120	$120	$120
Sublette #9	$100	$105	$105	$105	$105	$105	$100	$100	$100
Sweetwater #1	$75	$85	$85	$90	$90	$95	$95	$95	$100
Sweetwater #2	$78	$90	$90	$105	$105	$105	$105	$105	$105
Teton #1	$129	$112	$112	$104	$104	$104	$112	$112	$104
Uinta #1	$85	$83	$83	$88	$90	$90	$90	$90	$90
Uinta #4	$83	$83	$83	$100	$92	$92	$92	$92	$92
Uinta #6	$70	$70	$75	$75	$75	$75	$80	$80	$80

School District	School Year (Model Daily Rate)								
	2006-07 ($88.40)	2007-08 ($91.76)	2008-09 ($95.70)	2009-10 ($99.25)	2010-11 ($99.25)	2011-12 ($99.25)	2012-13 ($99.25)	2013-14 ($99.25)	2014-15 ($100.28)
Washakie #1	$85	$85	$85	$90	$93	$90	$90	$90	$105
Washakie #2	$55	$80	$85	$85		$85	$85		$85
Weston #1	$65		$80	$90	$90	$90	$90	$90	$90
Weston #7	$70	$85	$85	$85	$85	$85	$85	$85	$85

Source: LSO Analysis of Wyoming Education Association Salary and Benefits Books, 2007-2015.

Application of the RCA to Substitute Rates

Another issue brought forward by WASBO is whether to apply the RCA to the daily rate. We believe this recommendation has merit because it is a salary item subject to regional differences like all other salaries in the Legislative Model. We recommend starting in SY 2016-17 the daily substitute teacher rate should be adjusted by the RCA for each school district.

2015 Evidence-Based Recommendation: Provide for 5.715% (10 days) of core teachers, elective teachers, minimum teacher positions, tutors, ELL teachers, instructional coaches and teacher positions for summer school and extended day. Substitute teachers are resourced at a daily salary equal to $102.97 plus 7.65% for social security and Medicare benefits ($110.85). Daily salary adjusted by regional cost adjustment.

10. Core Guidance Counselors and Nurses

The 2015 EB Model recommendation modifies the 2010 EB Model recommendation to provide guidance counselor and nurse positions in the core program, and to provide additional pupil support positions (e.g., social workers and family liaison persons) on the basis of at-risk student counts as described in Element 27.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
CORE GUIDANCE COUNSELORS			
Provide 1.0 guidance counselor position for every 250 middle and high school students.	Provide 1.0 guidance counselor position for every 250 middle and high school students.	Provide 1.0 guidance counselor position for each prototypical elementary school (288 ADM) and 1.0 guidance counselor position for every 250 ADM in middle and high schools.	175.64 FTEs, $13,619,983
NURSES			
No nurses resourced directly, but can utilize minimum pupil support resources as nurse positions.	No nurses resourced directly, but can utilize minimum pupil support resources as nurse positions.	Provide 1.0 nurse position for every 750 ADM.	124.14 FTEs, $9,628,251

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Schools need guidance counselors and nurses. For guidance counselors, the EB Model uses the standards from the American School Counselor Association.[7] Those standards recommend one counselor for every 250 secondary (middle and high school) students. This produces 1.26 guidance counselor positions for a 315-student prototypical middle school and 2.52 guidance counselor positions for a 630-student prototypical high school.

Today many states require guidance counselors in elementary schools as well. Moreover, even in states that do not require counselors at the elementary level, a growing number of elementary schools have begun to employ these personnel. Consequently, the EB Model has been modified in recent years to include a minimum of one guidance counselor for a 288-student prototypical elementary school. As a result, we recommend recalibration of the Legislative Model to include a minimum of one guidance counselor position for each prototypical elementary school.

The physical and medical needs of students also have changed dramatically over the past several years. Many students need medications during the school day and school staff administer these medications often. Many students have additional medical or physical needs and our experience in several states suggests these needs have been growing over the past decade. Consequently, the EB Model has been enhanced to provide nurses as core positions. Drawing from the staffing standard of the National Association of School Nurses,[8] the EB Model provides core school nurses at the rate of one nurse position for every 750 students, prorated up and down without any minimum.

Resource Use Analysis

The CRERW report combines guidance counselors, nurses and other support personnel into one pupil support category to compare Legislative Model staffing to actual staff allocations in the districts. In addition, in some instances these personnel are reported to the WDE at the district-level, rather than the school level-level.
The dual reporting is a result of many school districts assigning pupil support personnel to multiple schools and then accounting for them as district-level, rather than school-level staff positions. In recent years, the WDE has worked with districts to assign the FTE of these personnel to their respective schools, and for the most part, the districts have made such assignments. However, a few districts continue to report some positions at the district level.

In 2013-14, the Legislative Model allocated a total of 550.1 pupil support positions. Districts employed a total of 534.79 school and district level pupil support positions filled, 15.5 fewer than generated. Across the state, a total of 525.71pupil support positions were reported at the school level, a difference of 24.41 from the 550.1 positions funded, illustrating, only 8.9 pupil support positions across the state were reported at the district level. An analysis of individual district pupil support staffing shows 19 districts employ fewer pupil support staff than are funded, while 29 have more pupil support staff than are funded.

2015 EB Recommendation: Provide 1.0 guidance counselor position for each prototypical elementary school (288 ADM) and 1.0 guidance counselor position for every 250 middle and high school ADM. Provide 1.0 nurse position for every 750 ADM.

[7] https://www.schoolcounselor.org/
[8] https://www.nasn.org/

11. Supervisory and Instructional Aides

The 2015 EB Model recommendation modifies the 2010 EB Model recommendation to provide three supervisory aide positions for each 630-student prototypical high school. The 2015 EB Model recommendation continues to resource two supervisory aides positions for prototypical elementary and middle schools with enrollments of 288 elementary school students and 315 middle school students.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide funding at an amount equal to 2.0 supervisory aide positions for each prototypical elementary school (288 ADM); 2.0 supervisory aide positions for each prototypical middle school (315 ADM); 5.0 supervisory aide positions each prototypical high school (630 ADM); resourced at the highest-grade prototype using total school ADM.	Provide funding at an amount equal to 2.0 supervisory aide positions for each prototypical elementary school (288 ADM); 2.0 supervisory aide positions for each prototypical middle school (315 ADM); 5.0 supervisory aide positions each prototypical high school (630 ADM); resourced at the highest-grade prototype using total school ADM.	Provide funding at an amount equal to 2.0 supervisory aide positions for each prototypical elementary school (288 ADM); 2.0 supervisory aide positions for each prototypical middle school (315 ADM); 3.0 supervisory aide positions each prototypical high school (630 ADM); resourced at the highest-grade prototype using total school ADM.	-68.52 FTEs, ($2,639,473)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Elementary, middle and high schools need staff for responsibilities that include lunch duty, hallway monitoring, before and after school playground supervision, and others. Covering these duties generally requires an allocation of supervisory aides at about the rate of two supervisory aide positions for a school of 400-500 students.

However, research does not support the use of instructional aides for improving student performance. As noted above (Element 2), the Tennessee STAR study, which produced solid evidence through field-based randomized controlled trials that small classes work in elementary schools, also produced evidence that instructional aides in a regular-sized classroom do not add instructional value, i.e., do not positively impact student achievement (Gerber, Finn, Achilles & Boyd-Zaharias, 2001).

At the same time, districts may want to consider a possible use of instructional aides that is supported by research. Two studies show how instructional aides could be used to tutor students. Farkas (1998) has shown that if aides are selected according to clear and rigorous literacy criteria, are trained in a specific reading tutoring program, provide individual tutoring to students in reading, and are supervised, then they can have a significant impact on student reading attainment. Some districts have used Farkas-type tutors for students still struggling in reading in the upper elementary grades. Another study by Miller (2003) showed instructional aides could also have an impact on reading achievement if used to provide individual tutoring to struggling students in the first grade. Neither of these studies supports the typical use of instructional aides as general teacher helpers.

Resource Use Analysis

The Legislative Model resourced 632.7 supervisory aides in SY 2013-14, while school districts actually employed 829.6 aides, a total of 196.9 more than funded. Half of the districts have more aides than allocated, half have fewer.

It is not clear from the CRERW report to what extent, if any, these aid positions are used as instructional aides in classrooms. In our School Use of Resources studies following the 2005 recalibration, we found a number of schools where instructional aides were employed, but we do not have evidence of how aides are used in schools today, nor whether aides employed as instructional aides have the training and experience Farkas found that can help improve student reading attainment.

Although the resource use analysis shows school districts hire more supervisory and instructional aides than provided by the Legislative Model, the CRERW report does not distinguish supervisory aides from instructional aides. Thus, from the available data, it is not possible to determine the degree to which districts hire fewer supervisory aides than are provided by the Legislative Model. However, as discussed in Element 26, school districts hire large numbers – hundreds – of instructional aides and not supervisory aides. Our assumption is school districts hire fewer supervisory aides than the Legislative Model provides.

Additional Analysis for the 2015 Recalibration

As noted above, the EB Model does not recommend use of instructional aides, but rather certified tutors. Both the EB and Legislative Models provide for two supervisory aide positions for the prototypical elementary (288 students) and middle (315 students) schools. The Legislative Model currently provides for five supervisory aide positions for the prototypical high school (630 students). The 2015 EB Model recommendation has changed for this element for high schools from five to three supervisory aide positions.

2015 Evidence-Based recommendation: Provide funding at an amount equal to two supervisory aide positions for each prototypical elementary school (288 ADM); two supervisory aide positions for each prototypical middle school (315 ADM); three supervisory aide positions each prototypical high school (630 ADM); resourced at the highest-grade prototype using total school ADM.

12. Librarians and Librarian Media Technicians

Most schools have a library, and the staff resources must be sufficient to operate the library and to incorporate appropriate technologies into the library system.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Fund at the district level rather than school level. For districts with 0-300 ADM, provide funding for 1 librarian and 1 library clerk. For districts with 301-630 ADM, prorate from the 300 ADM level up to 2 librarians, but retain the 1 librarian clerk for the 630 ADM. Above 630 ADM, 1 librarian for every 288 elementary ADM and 1 librarian and 2 library clerks for every 630 secondary ADM, with a minimum of 2 librarians and 1 library clerk. No library media technicians funded, but rather a separate computer technician position in central office.	_Librarian Positions:_ Provide 1.0 librarian position for prototypical elementary schools (288 ADM) prorate up and down, below and above 288 ADM. For middle or high schools with ADM between 105 and 630 ADM, 1.0 librarian position. Below 105 ADM prorate down and above 630 ADM prorate up. _Library Media/Computer Technician Position:_ Provide 1.0 library media/computer technician position for every 315 middle and high school ADM, prorated up and down.	_Librarian Positions:_ For elementary schools, provide librarian resources at the following levels: for elementary schools with ADM less than 96 ADM, prorate a 0.50 librarian position down; for elementary schools with ADM between 96 and 143, provide a 0.50 librarian position; for elementary schools with ADM between 143 and 288, provide a 1.0 librarian position prorated down to 143 ADM. For middle and high schools, provide librarian resources at the following levels: for middle and high schools with ADM less than 105 ADM, prorate a 0.50 librarian position down; for middle and high schools with ADM between 105 and 157.5, provide a 0.50 librarian position; for middle and high schools with ADM between 157.5 and 315, provide a 1.0 librarian position prorated down to 157.5 ADM. For all school districts, provide a minimum of 1.0 librarian position. _Library Aide Positions:_ For elementary schools, provide library aide resources at the following levels: for elementary schools with ADM greater	-44.06 FTEs Librarian FTEs, ($3,406,728) 72.97 Library Aide FTEs, $2,805,139

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
		than 288, prorate a 1.0 library aide position between 288 and 576 ADM; for elementary schools with more than 576 ADM, provide an additional library aide position for every 630 ADM. For middle and high schools, prorate up 1.0 library aide from 315 to 630 ADM; above 630 ADM prorate up 1.0 library aide for every additional 630 ADM. _School Computer Technician Position:_ Provide 1.0 school computer technician position for every 630 elementary, middle and high school ADM, prorated up and down, with a minimum of a 0.5 position for each district.	12.16 Computer Technician FTEs, $893,000 **Net Total for library all staff: 41.07 FTEs, $291,411.**

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

There is scant research on the impact of school librarians on student achievement. In 2003, however, six states conducted studies of the impacts of librarians on student achievement: Florida, Minnesota, Michigan, Missouri, New Mexico and North Carolina. In 2012, Colorado conducted a study using data from 2005-2011. The general finding was, regardless of family income, children with access to endorsed librarians working full time perform better on state reading assessments (Rodney, Lance, & Hamilton-Rennell, 2003; Lance & Hofschire 2012). The Michigan study found regardless of whether the librarian was endorsed, student achievement was better for low-income children, but having an endorsed librarian was associated with higher achievement than having an unendorsed librarian (Rodney, Lance, & Hamilton-Rennell, 2003). Each state examined the issue differently, but library staffing and the number of operating hours were generally associated with higher academic outcomes. The EB Model recommendation for library staff is derived from best practices in other states, state statutes where they exist and the above research.

Resource Use Analysis

The Legislative Model allocated 283.8 librarian positions in SY 2013-14. School districts employed 110.6 librarians, a difference of 173.2. The Legislative Model allocated 135.0 school computer technicians in SY 2013-14. School districts employed 364 of these positions, a difference of 229. In SY 2013-14, across the state's 48 districts, 47 employed fewer librarians than allocated, while only six employed fewer school computer technicians than allocated.

Additional Analysis for the 2015 Recalibration

Before the 2015 recalibration, the major differences between the EB and Legislative Models were:

- The 2010 EB Model recommendation provided resources at the district level rather than the school level;
- The 2010 EB Model recommendation prorated two librarians between 630 and 105 ADM while the Legislative Model provided a full librarian between those two student counts;
- The 2010 EB Model recommendation provided library clerks (which this memo calls library aides below), while the Legislative Model did not; and
- The Legislative Model provided school computer technicians at the rate of one for every 315 middle and high school students, whereas the 2010 EB Model recommendation provided a minimum of 0.50 position for district with 500 or fewer ADM or one position for every 1,000 ADM (Note: these positions are meant to provide schools with individuals who can provide first line computer technical assistance).

The 2010 EB Model recommendation has been modified by a revised 2015 EB Model recommendation to better reflect Wyoming and national library staffing averages. The revised EB recommendation also renames the Legislative Model's library media technician to a computer technician.

Table 3.14 provides information on the actual use of library and computer technology staff as compared to allocations in the Legislative Model. The Legislative Model allocated 286.6 librarian positions in SY 2014-15. Districts employed 106.1 librarians, a difference of 180.5 FTEs. Districts employed 179.7 librarian aides, where the Legislative Model does not allocate library aide positions. One assumption for this difference in staffing is some schools have replaced librarians with library aides (or clerks), and larger schools often staff libraries with a combination of one librarian and additional library aides, not multiple librarians. The Legislative Model allocated 135.3 school computer technicians for SY 2014-15 and districts employed 179.4 school computer technicians, a difference of 44.1 FTEs.

Table 3.14 Wyoming School District Librarians and School Computer Technicians

School Year	Legislative Model Librarian FTEs	Actual Librarian FTEs	Librarian Difference	Actual Librarian Aide FTEs	Legislative Model Computer Technician FTEs	Actual Computer Technician FTEs	Computer Technician Difference
2006-07	263.7	134.7	(129.0)	179.1	132.8	116.0	(16.8)
2007-08	265.0	134.5	(130.5)	184.1	131.6	142.3	10.7
2008-09	268.4	130.7	(137.7)	188.5	130.9	162.2	31.3
2009-10	271.6	127.8	(143.8)	191.0	130.9	168.3	37.4
2010-11	274.3	125.8	(148.5)	185.1	130.5	178.9	48.4
2011-12	277.0	124.2	(152.8)	190.8	132.5	177.8	45.3
2012-13	279.9	121.1	(158.8)	188.1	134.1	172.2	38.1
2013-14	283.8	110.6	(173.2)	184.0	135.0	179.9	44.9
2014-15	286.6	106.1	(180.5)	179.7	135.3	179.4	44.1

Source: WDE.

The following discusses library staffing in a manner that distinguishes library staff – librarians and library aides (what the 2010 EB recommendation termed clerks) – from computer technicians who provide computer technical help to schools. This analysis further clarifies how computer technicians (what the Legislative Model terms library media technicians) evolved from individuals who set up audio-visual equipment for teachers, to individuals who became the first line computer technical helpers, and should be considered a separate staff category, generally operating out of the district's technology office and not the library, though often supervised by school principals.

The importance of the school library as a resource-rich learning center has developed and evolved with the addition of technology. In libraries, students can explore and individualize their learning experience, using all modalities of learning, through access to both electronic and print materials that enhance the curriculum.

Librarians act as a partner in student achievement, assisting students to hone their 21st Century skills and preparing them to be successful in the post-secondary environment and the workplace. The library experience becomes more valuable to students and staff when libraries are staffed with certificated librarians and library aides that can help students effectively search, cull, and synthesize information found in the many books, magazines, and myriad sources available on the internet.

There is much anecdotal data about how librarians may enhance student learning and achievement; however, the empirical data are limited. Some studies demonstrate positive benefits; yet many of these benefits could be attributed to other sources as well. It is difficult to establish direct causality (American Association of School Librarians, 2014). Despite these challenges, various research sources cited in the desk audit report libraries and librarians, can play a role in increasing student achievement.

For libraries to be effective, they must be adequately staffed. Research is silent on the number of staff members required to provide useful service to school staff and students. Because of the lack of literature on library staffing numbers, it is appropriate to examine general practices in a large number of districts and states to understand what is working in school libraries across America.

<u>Librarians and Librarian Media Aides: The Revised EB Recommendations</u>

The revised EB recommendations allocate library staff to more closely align to general practices throughout the country and are identified in Table 3.15. The revised EB recommendation begins with school site ADM counts to allocate library staff. The basic revised formula provides one librarian for each prototypical 288 ADM elementary school and one librarian for each prototypical 315 ADM middle or high school. Below the prototypical levels, 288 elementary and 315 secondary, prorate the librarian position down, but to a minimum of 0.5 FTE position. Prorate down the 0.5 FTE position once elementary ADM falls below 96 and secondary ADM falls below 105. For small districts, the revised EB recommendation is to provide a minimum of one librarian position for each district.

Library aides, for elementary schools, would be generated at the rate of one for the first additional 288 ADM and then one library aide for every additional 630 ADM after the first 576 ADM (Note: it is highly unlikely an elementary school will have more than 576 ADM). For secondary schools, library aides would be generated at the rate of one for the first additional 315 ADM and then one library aide for every additional 630 ADM after the first 630 ADM. This staffing level ensures libraries are staffed by one full time librarian and library aides, not multiple librarians. This recommendation also is more reflective of national and Wyoming practice.

Table 3.15 Revised EB Model Staffing Formula for Librarians and Library Aides

Elementary Level - School Site		Secondary Level - School Site	
ADM	**FTE**	**ADM**	**FTE**
Librarians – *minimum of 1.0 FTE for each district*			
< 96	0.5 Librarian prorated down	<105	0.5 Librarian Prorated down
96-143	0.5 Librarian	105-157.5	0.5 Librarian
288-144	1 Librarian Prorated down to 0.5	315-157.5	1 Librarian prorated down to 0.5
Library Aides			
576	1 Library Aide prorated up from 288	630	1 Library Aide prorated up from 315
1,206	1 Library Aide prorated up from 288 and 1 prorated up from 576	1,260	1 Library Aide prorated up from 315 and 1 prorated up from 630

<u>Librarians: Staffing Comparisons Using Different Models</u>

In analyzing library staffing totals, it is instructive to compare the staffing levels of the Legislative Model, the revised EB Model, and national school library staffing averages.

In 2011-12, through an extensive survey of school libraries, the National Center for Educational Statistics (NCES) calculated average library staff in school libraries at both the elementary and secondary levels (NCES, 2015). To represent all staff working in the library, NCES categorized library personnel into three categories; librarians/media (aide) specialists, other professional staff, and other paid staff.

The Legislative Model on the other hand, allocates two types of personnel to the library; librarians and library media/computer technicians. Library media/computer technicians provide computer support and other general library media center services and tasks, and are discussed later in this memo and not considered in the following comparisons of library staffing.

Librarians: Elementary Level

NCES Averages

For elementary schools between 150 to 500 students, NCES found the average **total** school library staff was 1.66 FTE, consisting of 0.86 FTE of school librarians/media specialists, 0.18 FTE of other professional staff, and 0.61 FTE of other paid employees. As the number of students in an elementary school increases to 750 students and higher, the number of **total** library staff grows modestly to 1.87 FTE, consisting of 0.92 FTE school librarians/media specialists, 0.16 FTE of other professional staff and 0.79 FTE of other paid employees.

The NCES data described above demonstrate as school size increases, total library staff increase at a disproportionally smaller rate when compared with the rate of increases in student population. This makes evident that once a library has sufficient staff to meet the basic demands such as opening the doors and running the counter, additional personnel are hired at a much slower rate and in many cases not at all. For example, when elementary schools of 150 to 500 students were compared to schools with 750 or more students, the total library staffing only increased from an average of 1.66 FTE to an average of 1.87 FTE, respectively. This is an increase in student population of at least 50% compared to an increase in total library staffing of approximately 13%.

NCES Averages and the Legislative Model

To compare the Legislative Model to NCES data, prorated Legislative Model FTE staffing ratios can be used to calibrate school size to approximate NCES school size ranges. Using the Legislative Model's staffing proration with an elementary school of 500 students, the Legislative Model allocates 1.74 librarians/media specialists. This FTE amount is twice the NCES national average of 0.86 librarian/media specialists for a school of similar size.

However, at the elementary level, the Legislative Model does not provide for "other professional" staff (aides) and/or "other paid employees" as does the NCES averaged data. If total staffing were considered when comparing the Legislative Model and the NCES average data, the two would be comparable for a school of 500 students (1.74 librarian/media specialist to 1.66 total staffing, respectively).

As elementary school size increases, however, the Legislative Model resources more than the national average. For example, with an elementary school of 750 students, the Legislative Model would resource 2.60 librarians/media specialists while the NCES average school of this size would provide only 1.87 total staff.

The Legislative Model does not stop or throttle allocating staff after a particular site staffing ratio or basic staffing has been met, but instead continues to provide additional library staffing based on the increasing numbers of students at any particular school site.

NCES Averages, the Legislative Model and the Revised EB Recommendation

In the same elementary school of 500 students, the revised EB recommendation provides less librarian staffing (1.0 FTE) than the Legislative Model (1.74 FTE), but more than the national average (0.86 FTE). When comparing **total** library staff – librarians and library aides – at the 500 student elementary school, the revised EB recommendation provides the same as the Legislative Model (1.74 FTE) but the EB recommendation provides 1.0 librarian and 0.74 library aides while the Legislative Model provides 1.74 librarians. The NCES average provides 1.66 total library staff.[9]

Librarians: Secondary Level

NCES Averages

At the secondary level for schools up to 500 students, NCES estimated total average library staffing at 1.58 FTE, consisting of 0.78 school librarians/media specialists, 0.21 other professional staff, and 0.59 other paid employees. As the secondary school increases in size to between 750 to 1,499 students, total staffing increases to 2.07 FTE, comprised of 1.10 librarian/media specialists, 0.14 other professional staff and 0.84 other paid employees.

NCES Averages, the Legislative Model and the Revised EB Recommendation

The revised EB recommendation calls for 1.0 school librarian/media specialist for a 315 ADM or greater secondary school. This is consistent with NCES averages for the librarian/media specialist that generate between 0.78 school librarians/media specialists (500 students) and 1.10 school librarians/media specialists (750 students).

As the secondary student count rises to 1,260 students, the revised EB recommendation still generates 1.0 librarian/media specialist, but adds 2.0 library media aides for a total of 3.0 library staff. NCES school

[9] We note that the library media/computer technicians were included in the NCES surveys on *library* staff, because the "old" library media technician position has generally been dropped across the country.

respondents report 1.10 librarians at this number of students and 0.98 other library staff, 2.07 total staff. Under the Legislative Model the same 1,260 student school would be provided 2.0 FTE library/media specialists and 4.0 FTE library media/computer technicians, a total of 6.0 FTE.

In the example above, the Legislative Model provides almost three times the total number of staff than the NCES average. Significantly higher staffing resources in larger school settings might account for one of the primary reasons for why Wyoming districts as a whole are not using the entire library staff resources allocated.

School Computer Technicians: Staffing Comparisons Using Different Models

The school computer technician position has evolved. The Legislative Model resources library media/computer technicians (now called school computer technicians in the EB Model) at a rate of one for every 315 middle and high school ADM, prorated up and down, for all non-alternative schools and small schools. Our revised EB recommendation for this element resources school computer technicians at the rate of one for every 630 elementary, middle and high school ADM, prorated up and down, but with a minimum of 0.5 FTE position for each district.

As the number of computers continues to increase at the school site and online testing and curriculum become more prevalent, it becomes imperative for districts to deliver quick and efficient technology support to teachers and students. Districts can provide this support through the school computer technician. The school computer technician offers all “first level” support, including, solutions to basic break-and-fix issues, connectivity difficulties, configuration errors, and printing concerns. The school computer technician can set up an LCD projector for the principal, install software for a teacher, reset email and student-administration accounts, and clearly explain and demonstrate the proper use of computer hardware and devices from ergonomic mice to electronic Smartboards.

When the library was the sole source for multimedia materials, school computer technicians would wheel filmstrip projectors into classrooms to create multimedia experiences for students. Because of the nexus to multimedia, as computers entered the schools, the first computer laboratories were traditionally in or close to libraries. Many school computer technicians learned how to troubleshoot the machines based on their technical prowess and proximity to the lab environment.

As schools acquire more technology, using carts of laptops and banks of computers in classrooms, the “computer lab” function of the library is being distributed throughout the school. The library is no longer the only hub of multimedia resources and the sole keeper of the multi-media experience. Libraries now assist in directing students to resources.

For teachers and other staff to take full advantage of the benefits technology can provide, they need to feel support is close by and available. Having a school computer technician on campus can generate a sense of technological security.

General support for computers and for their maintenance and configuration has traditionally been district-based. School sites submit service requests to the district and wait to see when a technician will come. In the revised EB recommendation, district technicians still handle the more difficult issues, while school computer technicians have most of their time scheduled to be at specific campuses. They participate at the sites like a staff member and can be directed during their scheduled time by the principal and/or other site administrators.

2015 Evidence-Based recommendation:

Librarians and Librarian Aides: Provide one librarian for each 288-student prototypical elementary school and to each 315-student prototypical secondary school. Below those levels (288 elementary and 315 secondary), prorate the librarian position down but to a minimum of 0.5 position. Prorate down that half-time position once elementary ADM falls below 96 and secondary ADM falls below 105. For elementary schools, prorate up one library aide position for the first additional 288 students. For secondary schools, prorate up one library aide position for the first additional 315 students. Above 576 elementary students and 630 secondary students provide one library aide position for every 630 students. Provide a minimum of one librarian position for each school district.

School computer technicians: Provide school computer technicians at the rate of one position for every 630 elementary, middle and high school ADM, prorated up and down, but with a minimum of 0.5 FTE position for each district.

13. Principals and Assistant Principals

Every school needs a principal. There is no research evidence on the performance of schools with or without a principal. All comprehensive school designs, and all prototypical school designs from all professional judgment studies around the country, include a principal for every school unit.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, prorated by ADM below 105 ADM down to 49 ADM, resourced at the highest grade band level. Provide 1.0 assistant principal position for every 288 elementary ADM beginning at 289 ADM;1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM.	Provide 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, prorated by ADM below 105 ADM down to 49 ADM, resourced at the highest grade band level. Provide 1.0 assistant principal position for every 288 elementary ADM beginning at 289 ADM;1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM.	Provide 1.0 principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools. Provide 1.0 assistant principal position for every 288 elementary ADM beginning at 289 ADM and for elementary schools below 96 ADM; 1.0 assistant principal for every 315 middle and high school ADM beginning at 316 ADM and for middle and high schools below 105 ADM Resourced at the highest grade band level.	Principals: -14.60 FTEs, ($1,624,207) Assistant Principals: 22.00 FTEs, $2,101,900 *Note: net all assistant principal FTEs for alternative schools (Element 31 and schools below the smallest school prototype).*

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

In addition to principals, the EB and Legislative models provide assistant principals for schools larger than the prototypes of 288 elementary and 315 middle and high school students. Assistant principals are provided at the rate of 1 for every 288 elementary and 315 middle and high school students.

Resource Use Analysis

The Legislative Model provided 423.5 school site administrators (principals and assistant principals) in SY 2013-14. Districts employed a total of 373.8 or 49.6 fewer school administrators. Ten districts employed more site administrators than resourced, 35 employed fewer site administrators than resourced and three employed the same number of site administrators than resourced.

2015 Evidence-Based recommendation:

Principals: Provide one principal position for all schools down to 96 ADM for elementary schools and 105 ADM for middle and high schools, resourced at the highest grade band level.

Assistant Principals: Provide one assistant principal position for every 288 elementary ADM beginning at 289 ADM and one assistant principal position for elementary schools below 96 ADM, resourced at the highest grade band level. Provide one assistant principal position for every 315 middle and high school ADM beginning at 316 ADM and one assistant principal position for middle and high schools below 105 ADM, resourced at the highest grade band level.

14. School Site Secretarial Staff

Every school site needs secretarial support to provide clerical and administrative support to administrators and teachers, to answer the telephone, greet parents when they visit the school, help with paper work, etc. In the Legislative Model secretary positions are distinguished from clerical positions, the fundamental difference being secretaries have a 12-month appointment and clerical staff have a school year appointment.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Secretarial Staff: Provide 1.0 secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels. Provide an additional 1.0 secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle and high school ADM starting at 315 ADM.	Secretarial Staff: Provide 1.0 secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels. Provide an additional 1.0 secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle and high school ADM starting at 315 ADM.	Secretarial Staff: Provide 1.0 secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels. Provide an additional 1.0 secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle and high school ADM starting at 315 ADM.	19.25 Secretarial FTEs, $1,080,358

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Clerical Staff: Provide 1.0 clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM. Provide 4.0 clerical positions for every 630 high school ADM, prorated above and below 630 ADM. All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	Clerical Staff: Provide 1.0 clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM. Provide 4.0 clerical positions for every 630 high school ADM, prorated above and below 630 ADM. All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	Clerical Staff: Provide 1.0 clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM. Provide 2.0 clerical positions for every 630 high school ADM, prorated above and below 630 ADM. All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.	-73.60 Clerical FTEs, ($3,433,618)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

The secretarial ratios included in the EB Model generally are derived from common practices across the country. There is no research on the impact secretarial and clerical staff have on student outcomes, yet it is impossible to have a school operate without adequate staff support. We have revised the EB Model recommendation for high schools as part of the 2015 recalibration effort. Our new EB recommendation for high schools is to resource one clerical position for each 315-student prototypical school, rather than two positions.

Resource Use Analysis

In SY 2013-14 the Legislative Model resourced 700.8 secretarial and clerical positions while school districts employed 622.6 or 78.2 fewer school level secretarial and clerical staff.

2015 Evidence-Based recommendation:

Secretarial Staff: Provide one secretary position for all schools down to 96 elementary ADM and 105 middle and high school ADM, prorated by ADM below these ADM levels. Provide an additional one secretary position for every 288 elementary ADM starting at 289 ADM and every 315 middle and high school ADM starting at 315 ADM. All positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.

Clerical Staff: Provide one clerical position for every 288 elementary ADM and 315 middle school ADM, prorated above and below 288 elementary ADM and 315 middle school ADM. Provide two clerical positions for every 630 high school ADM, prorated above and below 630 ADM. All FTE positions prorated up or down from prototypical level and resourced at the highest-grade prototype using total school ADM.

DOLLAR PER STUDENT RESOURCES

This section addresses areas funded by dollar per student amounts, including resources for gifted and talented, professional development, instructional materials and supplies, formative/short cycle assessments, computers and other technology, career and technical education equipment and materials and extra duty/student activities.

15. Gifted and Talented Students[10]

A complete analysis of educational adequacy should include the gifted, talented, and able and ambitious students, most of who perform above state proficiency standards. This is important for all states whose citizens desire improved performance for students at all levels of achievement.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide an amount equal to $29.19 per ADM, inflated annually to $31.60.	Provide an amount equal to $30.27 per ADM.	Provide an amount equal to $40.00 per ADM.	$905,832

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Research shows that developing the potential of gifted and talented students requires:

- Effort to discover the hidden talent of low income and/or culturally diverse students;
- Curriculum materials designed specifically to meet the needs of talented learners;
- Acceleration of the curriculum; and
- Special training in how teachers can work effectively with talented learners.

<u>Discovering Hidden Talents in Low-Income and/or Culturally Diverse High Ability Learners</u>
Research studies on the use of performance assessments, nonverbal measures, open-ended tasks, extended try-out and transitional periods, and inclusive definitions and policies produce increased and more equitable identification practices for high ability culturally diverse and/or low-income learners. Access to specialized services for talented learners in the elementary years is especially important for increased achievement among vulnerable students. For example, high-ability, culturally-diverse learners who participated in three or more years of specialized elementary and/or middle school programming had higher achievement at high school graduation, as well as other measures of school achievement, than a comparable group of high ability students who did not participate (Struck, 2003).

<u>Access to Curriculum</u>
Overall, research shows curriculum programs specifically designed for talented learners produce greater learning than regular academic programs. Increased complexity of the curricular material is a key factor (Robinson & Clinkenbeard, 1998). Large-scale curriculum projects in science and mathematics in the

[10] This section is based on an unpublished literature review written by Dr. Ann Robinson, Professor, University of Arkansas at Little Rock.

1960s, such as the Biological Sciences Curriculum Study (BCSC), the Physical Science Study Committee (PSSC), and the Chemical Bond Approach (CBA), benefited academically talented learners (Gallagher, 2002). Further, curriculum projects in the 1990s designed to increase the achievement of talented learners in core content areas such as language arts, science, and social studies produced academic gains in persuasive writing and literary analysis (VanTassel-Baska, Johnson, Hughes & Boyce, 1996; VanTassel-Baska, Zuo, Avery & Little, 2002), scientific understanding of variables (VanTassel-Baska, Bass, Ries, Poland & Avery, 1998), and problem generation and social studies content acquisition (Gallagher & Stepien, 1996; Gallagher, Stepien & Rosenthal, 1992).

Access to Acceleration

Because academically talented students learn quickly, one effective option for serving them is acceleration of the curriculum. Many educators and members of the general public believe acceleration always means skipping a grade. However, there are at least 17 different types of acceleration, ranging from curriculum compacting (which reduces the amount of time students spend on material) to subject matter acceleration (going to a higher grade level for one class) to high school course options like AP or concurrent credit (Southern, Jones & Stanley, 1993). In some cases, acceleration means *content* acceleration, which brings more complex material to the student at his or her current grade level. In other cases, acceleration means *student* acceleration, which brings the student to the material by shifting placement. Reviews of the research on different forms of acceleration have been conducted across several decades and consistently report the positive effects of acceleration on student achievement (Gallagher, 1996; Kulik & Kulik, 1984; Southern, Jones & Stanley, 1993), including AP classes (Bleske-Rechek, Lubinski & Benbow, 2004). Multiple studies also report participant satisfaction with acceleration and benign effects on social and psychological development.

Access to Trained Teachers

Research and teacher reports indicate general classroom teachers make very few, if any, modifications for academically talented learners (Archambault, et al, 1993), even though talented students have mastered 40 to 50% of the elementary curriculum before the school year begins. In contrast, teachers who receive appropriate training are more likely to provide classroom instruction that meets the needs of talented learners. Students report differences among teachers who have had such training, and independent observers in the classroom document the benefit of this training as well (Hansen & Feldhusen, 1994). Curriculum and instructional adaptation requires the support of a specially trained coach at the building level, which could be embedded in the instructional coaches recommended (Element 7) (Reis & Purcell, 1993). Overall, learning outcomes for high ability learners are increased when they have access to programs whose staff have specialized training in working with high ability learners, which could be accomplished with the professional development resources recommended (Element 16) .

Overall, research on gifted programs indicates the effects on student achievement vary by the strategy of the intervention. Enriched classes for gifted and talented students produce effect sizes of about +0.40 and accelerated classes for gifted and talented students produce somewhat larger effectives sizes of +0.90 (Gallagher, 1996; Kulik & Kulik, 1984; Kulik & Kulik, 1992).

Practice Implications

At the elementary and middle school level, our understanding of the research on best practices is to place gifted students in special classes comprised of all gifted students and accelerate their instruction because such students can learn much more in a given time period than other students. When the pull out and acceleration approach is not possible, an alternative is to have these students skip grades in order to be exposed to accelerated instruction. Research shows neither of these practices systemically produces social adjustment problems. Many gifted students get bored and sometimes restless in classrooms that do not have accelerated instruction. Both of these strategies have little or no cost, except for scheduling and training of teachers, resources for which are provided by professional development (Element 16).

The primary approach to serve gifted students in high schools is to enroll them in advanced courses, such as AP and IB, to participate in dual enrollment in postsecondary institutions, or to have them take courses through distance learning mechanisms.

We confirmed our understanding of best practices for the gifted and talented with the directors of three of the gifted and talented research centers in the United States: Dr. Elissa Brown, Director of the Center for Gifted Education, College of William & Mary; Dr. Joseph Renzulli, The National Research Center on the Gifted and Talented (NRC/GT) at the University of Connecticut; and Dr. Ann Robinson, Director of the Center for Gifted Education at the University of Arkansas at Little Rock.

The University of Connecticut center also agreed with these conclusions and has developed a very powerful internet-based platform, Renzulli Learning, which could provide for a wide range of programs and services for gifted and talented students. This system takes students through about a 25-30 minute detailed assessment of their interests and abilities, which produces an individual profile for the student. The student is then directed, via a search engine, to 14 different internet data systems, including interactive web-sites and simulations that provide a wide range of opportunities to engage the student's interests. Renzulli stated that such an approach was undoubtedly the future for the very bright student and could be supported by a grant of $25 per student in a district. Field (2007) found that after 16 weeks, students given access to an internet-based program, such as Renzulli Learning to read, research, investigate, and produce materials, significantly improved their overall achievement in reading comprehension, reading fluency and social studies.

Resource Use Analysis

Gifted and talented was excluded from the CRERW report analysis. WDE data show in SY 2013-141, 24 districts reported a total of $7,684,766 in expenditures for gifted and talented education. It is likely other districts report gifted and talented expenditures in different accounting functions and objects. It is even possible the districts reporting gifted and talented expenditures in this category may have other expenditures in other functions or objects that could be coded as gifted and talented. School districts and Wyoming community colleges provide for students in high school to partake in dual and concurrent enrollment courses free of charge to the student.

Additional Analysis for the 2015 Recalibration

The current Legislative Model provides each district with $30.27 per student for gifted and talented programs. This figure has been sufficient to enable any student in the district to access the Renzulli Learning program. Renzulli Learning was originally run by NRC/GT. Since 2005, Renzulli Learning was sold to Compass Learning, an educational organization headquartered in Austin, Texas with technology-based applications used around the country, including some schools and districts in Wyoming. Compass Learning has renamed the Renzulli Learning program GoQuest. According to the company's website,[11] a student's first experience with Renzulli Learning is with the Renzulli Profiler, a detailed online questionnaire that allows the software to generate a personal profile of each student's top interests, learning styles, and expression styles, making it easier for teachers to get to know their students and effectively differentiate instruction. Once a profile is generated, students and teachers may use it to guide their exploration of the 40,000 online educational resources in the database. Students can engage in self-directed learning by exploring safe, fully-vetted resources that have been specifically matched to their individual profiles. Further, teachers can browse the database of resources to find activities that also align to specific objectives, skills, as well as State and Common Core Curriculum Standards.

[11] http://www.renzullilearning.com/whatisrenzullilearning.aspx

On July 20, 2015, we spoke with Troy Duffield, who is the Compass Learning's lead consultant for the region that includes Wyoming. He described the attributes of Renzulli Learning and other products provided by Compass Learning. In that conversation, we confirmed a new pricing structure for Renzulli Learning. The cost today is $40 per student for up to 125 students in a school, at which point the cost is $5,000 for a school and all students have full access to the program. If a figure of $40 per pupil were placed in the Legislative Model, all districts would be able to afford this gifted program.

Compass Learning also offers products that can be used for both teaching the regular curriculum and providing extra help to struggling students, and these additional products have been adopted by some Wyoming school districts. These products integrate the instructional strategies with results of testing data from three of the most popular testing systems many districts use: the MAP results from the Northwest Evaluation Association (NWEA), which most Wyoming districts use, the STAR Enterprise assessments from Renaissance Learning, and Scantron. The costs of these additional Compass Learning programs range from $70 to $115 per student per program, and could be funded from a district's regular instructional and professional development budgets or the resources provided by the at-risk or ELL programs.

Based upon our review of current costs for the Renzulli Learning (GoQuest) program, we recommend a rate of $40 per student for SY 2016-17, which equates to an increase of $9.73 per student or 24.3% for this specific element. This would allow all school districts – small or large – to provide a high quality gifted and talented program option for every child.

2015 Evidence-Based recommendation: Provide an amount equal to $40.00 per ADM for SY 2016-17.

16. Intensive Professional Development

Professional development includes a number of important components. This section describes the specific dollar resource recommendations the EB Model provides for professional development. In addition to the resources listed here, PD includes the instructional coaches described in Element 7 and the collaborative planning time provided by the provisions for elective or specialist teachers. Those staff positions are critical to an adequate PD program along with the resources identified in this section.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 10 days of student free time for training in salary levels; $116.76 per ADM for trainers, inflated annually to $126.40.	Provide 10 days of student free time for training in salary levels; $121.08 per ADM for trainers.	Provide 10 days of student free time for training in salary levels; $125.00 per ADM for trainers.	$364,744

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Effective teachers are the most influential factor in student learning (Rowan, Correnti & Miller, 2002; Wright, Horn & Sanders, 1997) and more systemic deployment of effective instruction is key to improving student learning and reducing achievement gaps (Odden, 2011a; Raudenbusch, 2009). All school faculties need ongoing professional development. Improving teacher effectiveness through high quality professional development is arguably one of the most important resource strategies identified.

An ongoing, comprehensive and systemic professional development strategy is the way in which all the resources recommended in this report are transformed into high quality, Tier 1 instruction that increases student learning. Further, though the key focus of professional development is for better instruction in the core subjects of mathematics, reading/language arts, writing, history and science, the professional development resources in the EB Model are adequate to address the instructional needs for gifted and talented, special education, ELL students, for embedding technology in the curriculum and for elective teachers as well. Finally, all beginning teachers need intensive professional development, first in classroom management, organization and student discipline, and then in instruction. The most effective way to "induct" and "mentor" new teachers is to have them working in functional collaborative teacher teams, discussed in Element 4.

Fortunately, there is recent and substantial research on effective professional development and its costs (e.g., Crow, 2011; Odden, 2011b). Effective professional development is defined as professional development that produces change in teachers' classroom-based instructional practice that can be linked to improvements in student learning. The practices and principles researchers and professional development organizations use to characterize "high quality" or "effective" professional development, draw upon a series of empirical research studies that linked program strategies to changes in teachers' instructional practice and subsequent increases in student achievement. Combined, these studies and recent reports from Learning Forward, the national organization focused on professional development (see Crow, 2011), identified six structural features of effective professional development:

- The *form* of the activity – that is, whether the activity is organized as a study group, teacher network, mentoring collaborative, committee or curriculum development group. The above research suggests effective professional development should be school-based, job-embedded and focused on the curriculum taught rather than a one-day workshop.
- The *duration* of the activity, including the total number of contact hours participants are expected to spend in the activity, as well as the span of time over which the activity takes place. The above research has shown the importance of continuous, ongoing, long-term professional development that totals a substantial number of hours each year, at least 100 hours and closer to 200 hours.
- The degree to which the activity emphasizes the collective participation of teachers from the same school, department, or grade level. The above research suggests effective professional development should be organized around groups of teachers from a school that over time includes the entire faculty.
- The degree to which the activity has a content focus – that is, the degree to which the activity is focused on improving and deepening teachers' content knowledge as well as how students learn that content. The above research concludes teachers need to know the content they teach, need to know common student miscues or problems students typically have learning the content, and effective instructional strategies linking the two. The content focus today should emphasize content for college and career ready curriculum standards.
- The extent to which the activity offers opportunities for active learning, such as opportunities for teachers to become engaged in the meaningful analysis of teaching and learning for example, by scoring student work or developing, refining and implementing a standards-based curriculum unit. The above research has shown professional development is most effective when it includes opportunities for teachers to work directly on incorporating the new techniques into their instructional practice with the help of instructional coaches (see also Joyce & Showers, 2002).
- The degree to which the activity promotes coherence in teachers' professional development, by aligning professional development to other key parts of the education system such as student

> content and performance standards, teacher evaluation, school and district goals, and the development of a professional community. The above research supports tying professional development to a comprehensive, interrelated change process focused on improving student learning.

Form, duration, and active learning together imply that effective professional development includes some initial learning (e.g. a two-week – 10 day – summer training institute) as well as considerable longer-term work in which teachers incorporate the new methodologies into their actual classroom practice, with guidance provided by instructional coaches. Active learning implies some degree of collaborative work and coaching during regular school hours to help the teacher incorporate new strategies in his/her normal instructional practices. It should be clear that the longer the duration, and the more the coaching, the more time is required of teachers as well as professional development trainers and coaches.

Content focus means effective professional development focuses largely on subject matter knowledge, what is known about how students learn that subject, and the actual curriculum that is used to teach the content. Today this means a curriculum program to ensure students are college and career ready when they graduate from high school. Collective participation implies professional development includes groups of and at some point all teachers in a school, who then work together to implement the new strategies, engage in data-based decision making (Carlson, Borman & Robinson, 2011) and build a professional community.

Coherence suggests professional development is more effective when the signals from the policy environment (federal, state, district, and school) reinforce rather than contradict one another or send multiple, confusing messages. Coherence also implies professional development opportunities should be given as part of implementation of new curriculum and instructional approaches, today focusing on the college and career ready standards. There is little support in this research for the development of individually oriented professional development plans; the research implies a much more systemic approach.

Each of these six structural features has cost implications. Form, duration, collective participation, and active learning require various amounts of both teacher and trainer/coach/mentor time, during the regular school day and year and, depending on the specific strategies, outside of the regular day and year as well. This time costs money. Further, all professional development strategies require some amount of administration, materials and supplies, and miscellaneous financial support for travel and fees. Both the above programmatic features and the specifics of their cost implications are helpful to comprehensively describe specific professional development programs and their related resource needs.

From this research on the features of effective professional development, the EB Model includes the following for a systemic, ongoing, comprehensive professional development program:

- Ten days of student free time for training embedded in the salary level; and
- Funds for training at the rate of $125.00 per student.

The resources for student free time and cost of training are in addition to instructional coaches (Element 7) and collaborative work with teachers in their schools during planning and collaborative time periods (Element 4).

Resource Use Analysis

The Legislative Model allocated $10,645,056 for professional development training in SY 2013-14. The school districts reported expenditures of $8,260,801, or 77.6% of the funds they received for that purpose. Eleven districts spent more than their professional development allocation, while 36 spent less, and one district did not report spending any money for professional development. We also recommend the Legislature urge all school districts to fully utilize the professional development resources to help all teachers acquire the instructional strategies and skills needed to improve instructional practice in ways that boost student learning.

2015 Evidence-Based recommendation: Provide 10 days of student free time for training in salary levels and $125.00 per ADM for trainers.

17. Instructional Materials

The need for up-to-date instructional materials is paramount. Newer materials contain more accurate information and incorporate the most contemporary pedagogical approaches. New curriculum materials are critical today as the school systems shifts to more rigorous college and career ready standards. To ensure that materials are current, twenty states have instituted adoption cycles in which they specify or recommend texts that are aligned to state learning standards (Ravitch, 2004). Up-to-date instructional materials are expensive, but vital to the learning process. Researchers estimate that up to 90% of classroom activities are driven by textbooks and textbook content (Ravitch, 2004). Adoption cycles with state funding attached allow districts to upgrade their texts on an ongoing basis instead of allowing these expenditures to be postponed indefinitely.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide $140.00 per ADM for elementary and middle schools and $175.00 per ADM for high schools, inflated annually to $152.44 for elementary and middle school and $190.55 for high schools.	Provide $345.77 per ADM for elementary and middle schools and $423.38 per ADM for high schools.	Provide $190.00 per ADM for elementary, middle and high schools.	($16,456,680)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

This analysis addresses two issues: instructional materials and library materials.

<u>Instructional Materials</u>

Wyoming adopted the Common Core State Standards (CCSS) in Language Arts and Mathematics in 2012. Access to standards-aligned instructional resources is critical for teachers and students to successfully implement these standards. Wyoming currently does not have textbook adoption cycles. However, Wyoming did amend the law during the 2015 General Session[12] to require the State Board of

[12] 2015 Wyoming Laws, Chapter 122.

Education to evaluate and review the uniformity and quality of the educational program standards not less than every nine years. Adoption cycles backed by State funding for materials allow districts to upgrade their textbooks and instructional materials on an ongoing basis instead of postponing these purchases indefinitely. In 2004, 20 states had instituted adoption cycles in which they specify or recommend texts aligned to state learning standards (Ravitch, 2004). These cycles range from five to seven years. Wyoming should consider a textbook adoption cycle as a mechanism of providing students with recent, relevant and reliable information. Textbook adoption is a time consuming, labor-intensive process; without state encouragement, these important decision processes can be delayed by districts for extended periods, to the detriment of the instructional programs and student learning.

The type and cost of textbooks and other instructional materials differ across elementary and secondary levels. Textbooks at the secondary level are more complex and thus more expensive. Elementary grades, on the other hand, use more workbooks, worksheets and other consumables than the secondary level. Both elementary and secondary levels require extensive pedagogical aides such as math manipulatives and science supplies that help teachers demonstrate or present concepts using different pedagogical approaches.

Textbook prices range widely. At the high school level, textbooks can cost from $80 to $140. Most major textbook companies now offer electronic versions of their texts; however, contrary to popular belief, these versions can be more expensive than the paper-based texts. Some digital versions are offered with time-bound contracts, much like library database subscriptions, while others may require the purchase of the paper texts with the digital license. Most digital-only materials from standard publishers are the same price or are only marginally discounted from the paper-based version. Many publishers will offer to sell the paper-based texts with the electronic version for a 20% to 30% premium.

Unless Wyoming decides to fund a one-to-one student computer program, it is not practical to rely exclusively on electronic-based textbooks. One-to-one programs also rely on home-based internet connectivity. Until a one-to-one computer program is funded, it is necessary to continue to purchase paper-based textbooks to ensure all students have access to curriculum-appropriate resources.

Considering the move to the CCSS, districts should focus on purchasing curriculum and instructional materials that will assist teachers to drive student success. The CCSS require more reading from information texts across all curricular subject areas. This necessitates the purchase of additional materials that have not been required prior to the implementation of these more rigorous curriculum standards Wyoming and virtually all other states have adopted. A minimum nine-year standard adoption cycle would allow districts to purchase new and updated instructional materials for each course and subject every nine years, ensuring curriculum materials are up-to-date and coincide with the standards review by the State Board of Education. We recommend providing $170 per student allow school districts to have a six-year standard adoption, providing more resources than the nine year review provided by law.
With more rigorous curriculum standards as a backdrop, the current EB Model recommendation is to create one unified rate of instructional materials, regardless of whether the student is an elementary or secondary school. The rate of $170 per student will support the purchase of instructional materials that are best organized to take advantage of Wyoming teaching strategies. This funding level would also allow the purchase of digital access to some textbooks if districts desire to adopt and experiment with digital access to textbook materials. If combined with a regular adoption cycle, this annual allocation will allow districts to focus on purchasing new curricular materials for one subject area a year, including textbooks and supplementary materials, all of which are needed to enable teachers to raise student achievement.

Library Materials

The NCES reports the average national expenditure for library materials in the SY 2011-12 was $16 per pupil, excluding library salaries (NCES, 2015). Over 90% of the $16 was spent on book titles and the remainder on other resources such as subscription databases. In the past, electronic databases were increasing in use, however use has declined in recent years as many instructional resources such as the Khan Academy and Wikipedia are offered free to the public.

Electronic database services vary in price and scope and are usually charged to school districts on an annual per student basis. Depending on the content of these databases, costs can range from $1-5 per database per year per student.

Inflating these numbers to adequately meet the needs of school libraries, we recommend funding of $20 per student to pay for library texts and electronic services. These figures modestly exceed the national average, allowing librarians to strengthen print collections. At the same time, it allows schools to provide, and experiment with, the electronic database resources on which students rely (Tenopir, 2003).

Adding this $20 per student figure to the $170 per student figure for instructional materials, brings the 2015 EB Model recommendation to $190 per student for instructional and library materials for SY 2016-17. If this recommendation is implemented across the estimated 93,098 Model ADM for SY 2015-16, it would decrease funding by an estimated $16.5 million and provide an estimated $17.7 million for textbooks, supplementary materials and library resources.

Resource Use Analysis

The WDE's CRERW report combined expenditures for instructional materials and technology into one category for reporting purposes. In SY 2013-14, the Legislative Model generated a total of $58,876,011 and the districts expended $48,979,678 or $9,896,334 less than allocated. This represents 83.2% of the funds generated by the Legislative Model for technology and instructional supplies. It is not possible to determine what proportion of this went for technology specific equipment and supplies and what for textbooks and other supplies. The WDE's 2013-14 CRERW report combined expenditures for instructional materials and technology into one category for reporting purposes.

2015 Evidence-Based recommendation: Provide an amount equal to $190.00 per ADM for SY 2016-17.

18. Short Cycle/Formative Assessments

The need to monitor students with IEPs and for teachers to engage in collaborative work using student data requires faculties to have access to short cycle, interim assessment data.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide $37.70 per ADM and not subject to an ECA.	Provide $37.70 per ADM and not subject to an ECA.	Provide $25.00 per ADM and not subject to an ECA.	($1,182,000)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Data-based decision making has become an important element in school reform over the past decade. It began with the seminal work of Black and William (1998) on how ongoing data on student performance could be used by teachers to frame and reform instructional practice, and continued with current best practice on how professional learning communities use student data to improve teaching and learning (DuFour, et al., 2010; Steiny, 2009). The goal is to have teachers use data to inform their instructional practice, identify students who need interventions and improve student performance (Boudett, City & Murnane, 2007). As a result, data-based decision making has become a central element of schools moving the student achievement needle (Odden, 2009, 2012).

Recent research on data-based decision making has documented significant, positive impacts on student learning. For example, Marsh, McCombs and Martorell (2010) showed how data-driven decision making in combination with instructional coaches produced improvements in teaching practice as well as student achievement. Further, a recent study of such efforts using a randomized controlled trial showed that engaging in data-based decision making using interim assessment data improved student achievement in both mathematics and reading (Carlson, Borman & Robinson, 2011).

There is some confusion in terminology when referring to these new assessment data. Generally, these student performance data are different from those provided by state accountability or summative testing. The most generic term is "interim data," meaning assessment data collected in the interim between the annual administrations of statewide assessments, though some practitioners and writers refer to such data as "formative assessments." There are at least two kinds of such "interim" assessment data. Benchmark assessments, such as those provided by the NWEA called MAP (www.nwea.org), which are given two to three times a year, often at the beginning, middle and end of the year. They are meant to provide "benchmark" information so teachers can see at the end of the semester how students are progressing in their learning. Sometimes these benchmark assessments are given just twice, once in the fall and again in late spring, and function just as a pre- and post-test for the school year, even though some practitioners erroneously refer to tests used this way as "formative assessments." These test data cannot be used for progress monitoring in a RTI program of extra help for struggling students.

A second type of assessment data is collected during shorter time cycles within every quarter, such as monthly, and often referred to as "short cycle" or "formative" assessments. These more "micro" student outcome data are meant to be used by teachers to plan instructional strategies before a curriculum unit is taught, to track student performance for the two to three curriculum concepts that would normally be taught during a nine week or so instructional period, and to progress monitor students with IEPs.

Examples of "short cycle" assessments include STAR Enterprise from Renaissance Learning (www.renaissance.com), which is in an online, adaptive system that provides data in reading/literacy and mathematics for grades PreK-12. The basic package costs less than $10 a student per subject, takes students about 20-30 minutes to be assessed, are aligned to the CCSS, can be augmented with professional development activities and programs and can be given as often as the teacher wishes. Many Reading First schools as well as many schools we have studied (Odden & Archibald, 2009; Odden, 2009) use the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessments (http://dibels.uoregon.edu).

The Wireless Generation, now one of three parts of Amplify which was launched in July 2012 as an education division of News Corp, has created an assessment, similar to DIBELS that can be used with a handheld, mobile, electronic device. The company also offers a web service that provides professional development for teachers on how to turn the results into specific instructional strategies, including video clips of how to teach certain reading skills. The cost is approximately $15 per student per year, plus approximately $200 per teacher for the device, and somewhat more for training, though the company usually uses a trainer-of-trainers approach.

Many districts have also developed their own benchmark tests in mainly core subject areas. Others use common unit or chapter tests to gauge interim student progress toward achieving standards. While these tests cannot be normed because of their localized origin, they can provide valuable information to site and district teachers and administrators to ensure students are learning and that teachers have covered the subject standards required in district pacing guides.

Though some "interim" assessments are teacher created, it often is more efficient to start with commercially available packages, most of which are administered online and provide immediate results. Short cycle assessments provide the information a teacher needs to create a micro-map for how to teach specific curriculum units. Analyses of the state tests provide a good beginning for schools to redesign their overall educational program. Benchmark assessments give feedback on each semester of instruction and are often used to determine which students need interventions or extra help. Teachers also need additional short cycle assessment and other screening data to design the details of, and daily lesson plans for, each specific curriculum unit in order to become more effective in getting all students to learn the main objectives in each curriculum unit to the level of proficiency.

When teachers have the detailed data from these interim assessments, they are able to design instructional activities that are more precisely matched to the exact learning status of the students in their own classrooms and school. In this way, their instruction can be much more efficient because they know the goals and objectives they want students to learn, and they know exactly what their students do and do not know with respect to those goals and objectives. With these data they can design instructional activities specifically to help the students in their classrooms learn the goals and objectives for the particular curriculum unit.

The costs of these powerful assessments are modest. The EB Model has provided $30 to $35 per student, which is more than sufficient for a school to purchase access to the system, as well as some specific technological equipment and related professional development. The Renaissance Learning STAR assessments can function as both interim and benchmark assessments, can be used to progress monitor students with IEPs, include both math and reading PreK-12, and cost less than this figure. Some districts have dropped Scantron, NWEA MAP, and Aims Web assessments and replaced them with just the single STAR enterprise system that provides all the information of the previous three, and at a lower overall cost.

Resource Use Analysis

The Legislative Model provides each district with $37.70 per ADM for assessment costs. In SY 2013-14, only 35 of the 48 districts reported expenditures in this category; it is not clear how assessment expenditures are recorded in the remaining 13 districts. Of the 35 districts reporting expenditures, only six spent more than allocated, while the remaining 29 spent less than allocated. Among the 35 districts reporting expenditures, total assessment expenditures amounted to $2,028,664, some $1,408,072 less than the $3,436,736 resourced.

Additional Analysis for the 2015 Recalibration

Funding for short cycle assessments is provided to enable teachers and school systems to purchase a variety of assessments, exclusive of the current statewide assessment, to track student progress during the school year, identify students who need interventions and engage in data-based decision making around student data.

Based upon our review of current costs for short cycle assessments, we recommend $25 per student, which equates to a reduction of $2.70 or 7.15% from the Legislative Model. We once again recommend the ECA not be applied to this figure in the future. This amount is adequate for districts to purchase sufficient interim assessment systems.

At the July 1-2 Stakeholder meetings, we were told schools and districts use a wide variety of student performance data beyond the statewide assessment. Participants further indicated their PLCs discuss the instructional implications of the assessment data on a regular basis.

Below we discuss the variety of assessment instruments available commercially to school districts and are currently in use in Wyoming. They include the NWEA MAP, DIBELS, AIMSWEB, FAST and Renaissance Learning's STAR Enterprise.

NWEA MAP

According to the Measures of Academic Progress (MAP) website, the assessments are electronically administered and scored achievement tests designed to measure growth in student learning for individual students, classrooms, schools, and districts. The assessments provide accurate and immediate scores to help teachers plan instructional programs, place new students in the appropriate courses, and screen students for special programs. MAP is a computerized adaptive testing system tailored to a student's achievement level. Each student takes a dynamically developed test. The program instantly analyzes the student's response to each question and based on how well the student has answered all previous questions, provides a question of appropriate difficulty next. The standard package includes assessments for reading, language usage, mathematics, and the upper math series (Algebra I, Geometry, Algebra II, Integrated Math I, and Integrated Math II). A science assessment has recently been added. Further, NWEA has created a Skills Navigator for math and reading that can be used to monitor students receiving interventions. The Skills Navigator is also an online assessment.

Nearly all Wyoming districts use the NWEA MAP assessments, which usually are administered in September, January and May and reflect "benchmark" assessments, i.e., assessments that show how students are progressing over the course of the year. In the fall, the results from the screener portion of the MAP can be used to place students into small reading or math groups, and to identify appropriate interventions. All districts need to use MAP if they access summer school (Bridges Program) funding, as the spring to fall scores show progress made over the summer.

The core MAP assessments can be administered three to four times a year. The cost for the reading, language usage and math assessments is $13.50 per student per year. The new science test costs an additional $2.50 per pupil. The Skills Navigator used for monitoring the progress of students with interventions can be administered as often as needed and costs $7 per student and covers both reading and math. All together these assessments would cost $23 per pupil. NWEA would negotiate a lower cost if the State negotiated a deal and paid for all students.[13]

DIBELS

One assessment mentioned by several schools was the DIBELS. DIBELS includes a set of procedures and measures for assessing the acquisition of early literacy skills from kindergarten through grade 6. They are administered by teachers and designed to be short (one to six minute) fluency measures used to regularly monitor the development of early literacy and early reading skills. DIBELS is comprised of seven measures to function as indicators of phonemic awareness, alphabetic principle, accuracy and fluency

[13] These cost figures were obtained from the NWEA Wyoming liaison for the MAP assessments, Carolyn Mock.

with connected text, reading comprehension, and vocabulary. DIBELS was designed for use in identifying children experiencing difficulty in acquisition of basic early literacy skills in order to provide support early and prevent the occurrence of later reading difficulties. The cost is a nominal $1 per student.

Representatives of most schools at the July 1-2 Stakeholder meetings stated DIBELS was most often administered by an instructional facilitator, guidance counselor or Title I teacher, or a trained paraprofessional, but not by the student's classroom teacher. Under these circumstances, the assessment data must then be provided to teachers if they are to use the results in classroom activities.

AIMSWEB

Another assessment frequently used in Wyoming is AIMSWEB. AIMSWEB, now owned by Pearson, is an assessment system that provides up to 33 alternate forms per skill, per grade. AIMSWEB covers more skill areas and grade levels than any other assessment system. Although browser-based scoring allows teachers to automatically upload scores to the AIMSWEB database system, the assessment itself is administered to each individual student by the teacher. AIMSWEB assessments include:

- Reading: early literacy, Spanish early literacy, reading (English and Spanish) and reading maze.
- Language arts: spelling and written expression.
- Mathematics: early numeracy, math concepts and applications, and math computations.
- Behavior: Exclusive screening, monitoring, and intervention tools for behavior and social skills.

The complete AIMSWEB package costs $6 per student.

FAST and Renaissance Learning's STAR Enterprise

A few Wyoming school districts are using online, computer adaptive assessment systems linked to a learning progression. One such system is FAST, an assessment covering both reading and mathematics available for low cost from the University of Minnesota. Another system is Renaissance Learning's STAR Enterprise, which includes early literacy, mathematics and reading. These systems require much less staff time than the aforementioned teacher administered assessments as students can take these assessments virtually on their own. Since they are online computer adaptive systems, they provide immediate feedback to teachers and include many instructional strategies to address any learning needs identified by the results. Both of these assessments can be administered as often as needed, at no extra cost, so they work well for progress monitoring.

The STAR Enterprise assessment programs support "instructional decisions, RTI, and instructional improvement" by measuring student progress in early literacy, reading, and mathematics. The early literacy program measures student proficiency from the pre-kindergarten to grade 3. The reading and math programs assess student skills for grades 1 to 12. A science assessment is also being developed.

Subscriptions to STAR Enterprise products cost $3.80 per student for each assessment: math, reading and early literacy. The smallest subscription size available is 100 students. A more comprehensive subscription, STAR 360, costs $11.45 per student. In addition to the per student subscription fee, subscribers must pay a small annual fee ($500 in 2013) for online product hosting services. New subscribers to STAR Enterprise pay a one-time licensing fee of $1,600.

Addressing the Costs of Assessment

Though districts need interim assessments to provide teachers with interim data for instructional decision making, grouping students, identifying appropriate interventions for struggling students, and monitoring the progress of all students, many districts have adopted too many and often overlapping assessments. DIBELS is largely a screener assessment. AIMSWEB, FAST, MAP and STAR Enterprise also can function as screeners. Districts do not need both DIBELS and one of FAST, MAP or STAR Enterprise. Further, DIBELS and AIMSWEB, while popular, also require teachers to administer the assessments. For these reasons, the computer adaptive assessments – STAR Enterprise, MAP and FAST – have become more popular in many places, often replacing both DIBELS and AIMSWEB.

For more information about benchmark assessments, Hanover Research[14] recently completed an extensive review of the above and other interim assessment systems, including costs and ratings of them from the National Center for Response to Intervention.

2015 Evidence-Based recommendation: Provide $25.00 per ADM and not subject to an ECA.

19. Technology and Equipment

Over time, schools need to embed technology into instructional programs and school management strategies. Today, states require students not only to be technologically proficient but also to take some courses online in order to graduate from high school. Further, there are many online education options, from state-run virtual schools such as those in Florida and Wisconsin, to those created by private sector companies who run many virtual charter schools, such as K12 Inc. and Connections Academy. "Blended instructional" or "the flipped classroom" models, such as Rocketship, have also emerged (Whitmire, 2014). These programs infuse technology and online teaching into regular schools, provide more one to one student assistance, and put the teacher into more of a coaching role (see Odden, 2012). Research also shows these technology systems work well for many students, and can work effectively in schools with high concentrations of lower income and minority students (Whitmire, 2014). Moreover, they can be less costly than traditional public schools (Battaglino, Haldeman & Laurans, 2012; Odden, 2012).

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide an amount equal to $250.00 per ADM, inflated annually to $272.22.	Provide an amount equal to $302.71 per ADM.	Provide an amount equal to $250.00 per ADM and not subject to an ECA.	($4,907,038)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Infusing technology into the school curriculum has associated costs for computer hardware, networking equipment, software, training and personnel associated with maintaining and repairing these machines. If these technology elements are not maintained and updated, teachers and students will become disengaged and learning opportunities will be lost.

Purchasing and embedding technology into the operation of schools has both direct and indirect costs. Direct costs include expenditures for the hardware, software, and labor costs for repairing and

[14] Hanover Research. (2013). *Review of K12 Literacy and Math Progress Monitoring Tools*. Washington, D.C.

maintaining the infrastructure and machines. Indirect costs include the expenditures for professional development, loss of time for self-support and casual learning, and additional hours of user application development. This section focuses on direct technology costs, as the indirect costs of training and ongoing professional development are addressed in other elements.

The EB Model assumes Wyoming schools are not beginning at a baseline of zero. All Wyoming schools have a variety of computers of varying ages, the large majority of which are connected to school networks and the internet. Schools have been wired and most are now adding Wi-Fi capabilities and increasing bandwidth. The EB Model assumes major capital expenses such as access to fiber optics have been covered, or will be covered, with other funds from the school capital construction program.

This cost analysis includes funds for upgrading network switchgear and central servers that occur in the normal course of maintenance.

We refer readers to more detailed analysis of the costs of equipping schools with ongoing technology materials (Odden, 2012) spearheaded by Scott Price, now Chief Financial Officer for the Los Angeles County Office of Education. The analysis estimated four categories of technology costs totaling $250 a student. The amounts by category should be considered flexible, as districts and schools need to allocate dollars to their highest technology priority outlined in state and district technology plans.

The per-student costs for each of the four subcategories are:

- Computer hardware: $71
- Operating systems, productivity and non-instructional software: $72
- Network equipment, printers and copiers: $55
- Instructional software and additional classroom hardware: $52

This per student figure is sufficient for schools to purchase, upgrade and maintain computers, servers, operating systems and productivity software, network equipment, and student administrative system and financial systems software, as well as other equipment such as copiers. System software packages vary dramatically in price; the figure recommended would cover medium priced student administrative and financial systems software packages.

The $250 per student figure, originally developed in 2006 and updated for the 2010 recalibration, allows a school to have one computer for every two to three students. This ratio was sufficient to provide every teacher, the principal, and other key school-level staff with a computer, and to have an actual ratio of about one computer for every three-to-four students in each classroom.

Over the last few years, computer makers have developed alternative products, such as netbooks, Chromebooks and tablet computers that have a lower entry price point of about $300 per unit compared to the $500 to $800 cost for laptop or desktop computers. For school districts that value lowering the student-to-computer ratio, purchase of these devices provides an opportunity to significantly increase the number of student devices when replacing traditional units at their end-of-life. By using non-traditional form factors with lower-priced units, districts can purchase more units and lower their student-to-computers ratios. Additionally, many times it is cheaper for a district to buy additional units of these less expensive computers than to purchase multi-year service agreements.

Though Chromebooks use a different operating system than typically used in the educational environment, most instructional and interactive testing software is browser-based, making the instructional software agnostic regarding operating systems. Additional software is being continually developed for these new platforms as they become more commonly used in the educational space. Google develops applications that will work offline when a Chromebook is not connected to the internet. However, when the Chromebook is not connected to the internet, the functionality of the applications may be limited. This can be a disadvantage for low-income students in one-to-one models or loan program models who do not have internet access at home. Finally, Chromebooks and other such platforms are still not appropriate for the school or district administrative office functions.

As the ratio of these new devices to traditional devices increases there is opportunity for districts to explore one-to-one student-to-computer ratios at key grade levels. As high stakes computerized testing is pushed further into the primary grade levels, moreover, it is essential students are able to comfortably use computers to demonstrate their knowledge. If students have not had sufficient practice with computers in a testing environment, computerized testing can become a barrier to successfully assessing student achievement. If students cannot comfortably type, text responses become more of a test of “hunt and peck” skills than a reflection of the student’s ability to respond to a prompt.

Although Wyoming is still using paper-based statewide assessments, if or when the State decides to move to online testing, districts will need to increase the number of devices they have and expand their internet bandwidth to accommodate this testing. Students will also have to become accustomed to using headphones which are required when testing groups of students together. Again, it is important students feel comfortable with the computers they will use for testing so the hardware does not become a barrier to assessing student knowledge. Many Wyoming students already have some experience in online testing as most Wyoming districts use the NWEA MAP online assessment system for benchmark assessment data and to show student performance gains for summer school programs.

In considering the above factors, if a district begins to adopt a mix of standard and low cost units into district inventories, the average cost of a computer unit will drop depending on the percentage of higher and lower priced form factors. Despite this drop in average cost, the EB Model recommendation remains at $71 per student for computer hardware, recognizing that introducing lower priced units will allow districts to move closer to a one-to-one student to computer ratio and improve refresh rates on all units. It will also allow students to experience a wider breadth of form factors that will better prepare them for the workplace.

In the past, the EB Model has recommended districts either incorporate maintenance costs into lease agreements or, if purchasing the equipment, buy 24-hour maintenance plans to eliminate the need for school or district staff to fix computers. For example, for a very modest amount, one can purchase a maintenance agreement from a number of computer manufacturers that guarantees computer repair on a next business day basis. In terms of educator concerns that it would be difficult for a manufacturer’s contractors to serve remote communities, the maintenance agreement makes meeting the service requirements the manufacturer’s or contractor’s problem and not the district’s problem. Many of the private sector companies that offer such service often take a new computer with them, leave it, and take the broken computer to fix, which often turns out to be more cost effective than to send technicians to fix broken computers. On the other hand, when districts analyze the cost of warranty programs for Chromebooks or similar low cost hardware, they may find it is more practical to replace broken machines than to pay for extended warranties.

As the number of computers in schools increases, it becomes more impractical to hard-wire connections into classrooms or other instructional spaces. Wireless connectivity is the only solution to creating an instructional environment in which internet access is available anywhere, anytime on campus. Depending on campus configuration, it is possible to serve a small group of wireless computers with just a few wireless access points. However, as the number of computers being simultaneously used increases, additional access points must be added. The original EB Model recommendation for technology and equipment included modest funds to complete small on-campus infrastructure improvements.

The 2015 EB Model recommendation for technology remains at $250. Additionally, it is our recommendation this element not be subject to the ECA in the future. If factoring in inflation, the cost of some computer related items has decreased although the absolute dollar amount has stayed the same. As technology has improved, however, price points for many technologies have remained fairly constant as the capacity and demands increase. While general computer and server costs have declined, other technology costs have risen. For example, as the need for bandwidth has increased, the older network switches with speeds of 100 megabits have been replaced with gigabit switches that cost the same as a 100 megabit seven years ago. If Wyoming continues to fund school-based technology and equipment at $250 per ADM, districts will be able to gradually upgrade necessary network equipment within their campuses and to lower their student-to-computer ratios using a mixture of traditional and new devices.

One-to-One Computing [Optional Consideration]

One-to-one computing, meaning each student is issued a laptop to use in all classes and at home, has been successfully implemented in some grade levels in districts across the country. Maine, which began a program of providing every student with a computer, has one of the longest running implementations of such a program.

Districts and schools usually begin one-to-one programs by assigning computers at a specific grade level and then letting the students use the computers as they advance to the next grades. In this manner, districts can build a one-to-one computer program over a series of years.

One-to-one programs are very expensive. These programs raise the cost of all four areas of the previously listed formula, namely: 1) computer hardware, 2) operating systems, productivity and other non-instructional software, 3) network equipment, bandwidth, Wi-Fi coverage, and 4) instructional software.

The largest increase occurs in computer hardware. In a one-to-one program, districts need to purchase a business grade laptop, approximately $850 for a Windows-based machine, with a three-year warranty which accounts for $120 of the cost. A cost of $850 may seem to be a high price for a laptop when local office superstores advertise a Windows 8, or now Windows 10, laptop for as little as $300. However, these less expensive laptop models are consumer grade and many come with very limited, short-term warranties. Implementing a one-to-one laptop program requires districts to utilize a business-grade model of laptop specifically designed for a large enterprise like a school district.

The business-grade laptop model is designed with stronger materials to guard against wear-and-tear that occurs in the normal course of usage. It is a machine that has advanced specifications to ensure its relevance and usefulness over the four years a student will use the laptop. The laptop is based on standardized parts from the same manufacturer. This type of design provides a "constant" form factor with hardware components requiring only one set of common software drivers. This consistent design simplifies maintenance allowing a machine to be re-imaged in a few hours instead of requiring a technician to search for unique hardware drivers, recreate network settings, install print drivers and perform other such time-consuming tasks.

The Chromebook does present a less expensive platform than a Windows-based machine. Though Chromebooks have been used successfully at all grade levels, they are most commonly used in the primary grades. Chromebooks use Google Apps, which provide a basic word processor and presentation software. Google Apps has a much more limited set of features than Microsoft or Apple productivity suites. Google Apps utilize cloud computing, meaning the software resides on a server in an offsite location accessible by the internet. If a Chromebook does not have internet access, Google Apps become even more limited. This means if a student takes a Chromebook home, but does not have internet access there or cannot configure their internet access to connect the Chromebook, then its value at home to the student becomes nominal.

For secondary students, a Windows or Apple platform helps prepare students for the workplace and/or the postsecondary environment. A Windows or Apple based machine has access to the full suite of productivity software used in businesses whether online or offline. Apple and Windows solutions also have robust image and video editing solutions not yet available with the Chromebook.

Apple has an excellent line of laptops for education. However, they are even more expensive than Windows-based platforms. This is the reason this analysis uses an enterprise grade, Windows laptop price to demonstrate the average cost of implementing a one-to-one program. Districts may be able to provide a one-to-one program for less by utilizing a Chromebook or other “netbook” platforms in the elementary grades, or even across grades. Other districts may choose the Apple platform, but should expect to spend additional funds for hardware.

The reason why the cost of a one-to-one program increases so quickly is the number of computers triples if a district has a three-to-one student to computer ratio. In a three-to-one ratio, three students bare the cost of one device over a four to five year timeframe. With a one-to-one program, one student carries the cost of one computer laptop over a shorter, three to four year period. To support the cost of an $850 laptop, assuming a four-year computer refresh rate for both, a three-to-one student to computer ratio would require the support of just under $71 per student ($850 divided by 4 years equals $212, that result divided by 3 students equals $71 per student). In a one-to-one program, the same laptop would require the support of $212 per student, three times the cost of the three-to-one ratio. The dynamics of this equation change with the device. Chromebooks would be less; laptops from Apple more.

Because going to a one-to-one ratio from a three-to-one ratio triples the number of computers, a tripling of the other three costs within the $250 formula might be assumed. However, the cost curve is not as steep in the other three areas depending on the specific situation within each district.

For example, the $250 per student formula sets aside $55 per student for networking equipment, printers, and copiers. This figure presupposes capital costs for installation of district and school networks has already occurred and schools and districts are upgrading or replacing networking equipment such as switches and routers on a longer-term maintenance cycle. Considering the ongoing nature of the cost of these items, it would be very difficult to set aside funds from this area to extend the network or increase its capability, thus resources for copiers, printers, and the supplies needed to run these machines also come from this area.

To upgrade all district and school networks with the capacity to support a one-year implementation of a district wide one-to-one program would prove challenging and very expensive. Doubling or tripling the $55 per student cost might not be sufficient to complete this type of effort. Wyoming, however, because it has not moved statewide assessment online, has time to invest in the schools’ networks in a more reasonable timeframe. To achieve a more sustainable pace of improving internet access quality and coverage, the Legislature could double the $55 network cost to $110 per student, using the funds to extend their networks and increase bandwidth gradually. These are for within school costs such as switchgear at the main distribution facility (MDF) and in the intermediate distribution facilities (IDFs or switches for a building, or a building wing or even just a classroom) to handle the additional band width; additional IDFs in uncovered areas of the campus; wireless access points and wireless management software and server; fiber and/or copper wire runs to those additional IDFS and wireless access; additional access points to infill the existing network because few classrooms have enough drops to connect each computer in one-to-one. IDFs are connected to the MDF, which is connected via routers to the internet.

When districts in other states began computerized statewide assessments, many found the additional demand on their networks hindered a successful implementation of the testing. Networks simply had not been designed to handle the bandwidth necessary to adequately accommodate large numbers of computers all demanding bandwidth at once throughout all areas of the campus. Districts had to scramble to find funds to extend their networks, mainly through Wi-Fi, and increase their bandwidth by buying new switches and routers and converting older connections. One-to-one programs, if successfully implemented, can produce the same network demands of online testing each day of the school year.

To successfully implement one-to-one programs, all areas of the campus must provide internet connectivity ensuring every student has access to sufficient bandwidth anytime and from any learning space within the campus. If students are dropped from the network or there is slow access, the learning process is interrupted and students are distracted. Although Wyoming has still not re-implemented online statewide assessments, if the State decides to move in this direction it will be necessary to support districts in upgrading and extending their networks. In a high-stakes online testing environment, insufficient bandwidth will be a barrier to successful implementation and has the potential to mask student achievement.

Most campuses that have found the need to upgrade and extend their networks have chosen to do so through Wi-Fi. This is now the cheapest and most effective way to spread adequate bandwidth to all learning spaces. Large scale implementation of Wi-Fi requires management software and hardware that can control and shift Wi-Fi resources based on the ebb and flow of need during the school day. Managed Wi-Fi is important in a non-one-to-one environment and absolutely necessary in a densely packed one-to-one situation. District technology personnel need the "dashboard" types of management that helps them understand bandwidth pinch points. Management of the Wi-Fi network creates an ongoing additional cost to the networking element of the formula.

It should be noted that once a network is “extended,” meaning access points have been placed to provide sufficient bandwidth to all areas of the campus, the ongoing cost of this element would diminish, but would not return to the $55 dollars per student as there are now more devices to maintain and replace in a natural maintenance cycle.

The other two elements of the formula deal with software, both enterprise software for financial and student systems, and instructional software such as productivity or subscription-based data bases. The cost increase in these areas depends on the licensing. If licensing is per machine, then costs will increase as the numbers of computers rises. If the software is cloud-based and driven by the number of user logins, then additional machines will not generate additional costs. One example is the Microsoft Office package. Purchasing the license to install on a machine equates to a cost per machine; however, when using Office 365, the cost is per user and the user can download that package on multiple machines.

If all software were based on the number of logins and users, there would be no additional costs to these two software elements in a one-to-one implementation. However, if all software licenses were based on the number of computers on which the software resides, then the cost in this area would triple like the cost of the computers. The more likely scenario lies somewhere in between these extremes, with districts utilizing various products from the two different categories. For this reason, the one-to-one model estimates toward the middle, doubling the cost instead of tripling or projecting no increase at all. The actual cost will differ in each school district based on the mix it has. If extra funds are unspent in these two software elements, they should be directed to accelerate the network extension and the increase of bandwidth.

Table 3.15 summarizes cost difference for a three-to-one and one-to-one student to computer ratio. The three-to-one student to computer ratio, the cost per student in the EB Model recommendation is $250 per student and the one-to-one environment, increases the cost to approximately $571 per student, depending on the current networking capabilities of the district and its component schools and the software licensing agreements it maintains. It is important to note this does not include the increased costs for additional personnel needed to service the associated issues that come with three times as many computers.

Table 3.15 Cost of Implementing a 1-to-1 Student to Computer Ratio from a 3-to-1 Student to Computer Ratio*

Subcategory	3-to-1 Student-to-Computer Ratio	1-to-1 Student-to-Computer Ratio
Computer Hardware	$71	$213
Networking Equipment, Copiers, Printers	$55	$110
Non-Instructional Software	$72	$144
Instructional Software	$52	$104
Total Cost per Student	**$250**	**$571**

***** Costs are associated with implementing a one-to-one computing program with a full-featured Windows-based laptop. Computer hardware costs could be lowered significantly using Chromebooks. Cost savings would vary depending on the mix of platforms selected for the specific implementation.

Benefits of One-to-One Computing

Advocates of one-to-one computing cite various benefits, including: improved student achievement (especially in writing skills), increased student engagement and collaboration, better implementation of project-based learning, an expansion of learning beyond the classroom, and instant access to information. Opponents claim it is difficult to isolate technology as the only contributing factor to these benefits. Other drawbacks mentioned include: the cost, need for increased student supervision, and the necessity to provide additional professional development to teachers and other district staff (Sauers & Mcleod, 2012; Jackson, 2009; Goodwin, 2011).

One of most important benefits of implementing a one-to-one program consists of extending the learning environment beyond the school day to the home. However, unless internet access is ensured at a student's home and teachers use technology to change their strategies to take advantage of this access, then this benefit will be left unrealized.

One of the clear advantages of a one-to-one program is students collaborate more in off-hours on projects. This increases the frequency with which they practice writing and communicating in written and other forms. Once again, this depends on the internet access away from the school.

Three basic scenarios exist regarding internet access at home. If a student already has internet access and a computer terminal provided at home for their use, it is likely that they will continue to use the home computer and the one-to-one laptop will remain in the backpack. Alternatively, if the student has internet access at home but does not have access to a family computer, then the laptop would be used to varied success depending on whether the laptop could be configured to access the home connection and the software installed on the machine was cloud-based. In the third scenario, the student has no internet access and no family computer available. In this case, the student will use the computer if applications are installed on the laptop, but would not be able to take full advantage of cloud-based software or even basic collaborative tools such as email or document sharing. In short, technology provides access to resources.

One-to-one programs can extend access to technology beyond the school day if conditions are right to connect to the internet in the home.

Successful one-to-one programs are driven by district/school leader advocates for these programs (Oliver, 2012). These programs demand a high level of coordination between the instructional and business sides of the school district. They require board and community support. This is why one-to-one is not a decision to be taken lightly and why states and/or districts usually experiment with pilot projects either at a school or grade level. If one-to-one programs were less complex and less expensive, many more districts and states would be implementing them.

The Legislature may want to consider creating a specific competitive grant program for districts to institute one-to-one model programs that could be evaluated and emulated. Different form factors and platforms could be used to understand the strengths of each: Chromebook, Windows, and Apple. Different configurations of the one-to-one programs such as grade level, school level (elementary vs. secondary) and school based, could be explored. Various successful programs have been implemented across the nation. This would give Wyoming educators and opportunity to utilize one of these successful models to implement a program in its own educational environment.

The State could fund this program by reducing the current allocation for technology expenditures from the Legislative Model level to the EB Model recommendation of $250 per student or could simply fund the program based on local interest in one-to-one programs.

Resource Use Analysis

The WDE's CRERW report combined expenditures for instructional materials and technology into one category for reporting purposes. In SY 2013-14, the Legislative Model allocated a total of $58,876,011 for school districts, who in turn spent $48,979,678 or $9,896,334 less than allocated. This represents 83.2% of the funds generated for technology and instructional supplies. It is not possible to determine what proportion of this went for technology specific equipment and supplies and what for textbooks and other supplies. Costs for instructional supplies are detailed in Element 17

2015 Evidence-Based recommendation: Provide an amount equal to $250.00 per ADM and not subject to an ECA.

20. Career Technical Education Equipment/Materials

Vocational education, or its modern term, career and technical education (CTE), has experienced a shift in focus in the past decade. Traditional vocational education focused on practical, applied skills needed for wood and metalworking, welding, automobile mechanics, typing and other office assistance careers, as well as courses in home economics. Today, many argue that vo-tech is more appropriately info-tech, nano-tech, biotech, and health-tech. The argument is CTE should begin to incorporate courses that provide students with applied skills for new work positions in the growing and higher wage economy including information technologies (such as computer network management), engineering (such as computer-assisted design), a wide range of jobs in the expanding health portions of the economy and bio-technical positions – all of which can be entered directly from high school. The American College Testing Company and many policymakers have concluded the knowledge, skills and competencies needed for college are quite similar to those needed for work in the higher-wage, growing jobs of the evolving economy, so all students need a solid academic high school program to be college and career ready when they graduate from high school.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide an amount equal to $9,027.27 per vocational education teacher FTE ($1,739.70 for equipment allowance; $6,418.39 for supply allowance; $869.18 for replacement allowance) inflated annually to $9,829.59.	Provide an amount equal to $9,361.46 per vocational education teacher FTE ($1,804.10 for equipment allowance; $6,655.99 for supply allowance; $901.36 for replacement allowance).	Provide an amount equal to $9,361.46 per vocational education teacher FTE.	$0

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

A key issue is the cost of CTE programs. Many districts and states believe that new CTE programs cost more than the regular program and even more than traditional vocational classes. However, in a review conducted for a Wisconsin school finance adequacy task force, a national expert on CTE (Phelps, 2006) concluded the best of the new CTE programs did not cost more, especially if the district and state made adequate provisions for professional development (as teachers in these new programs needed training) and computer technologies (as computer technologies were heavily used). These conclusions generally were confirmed by the cost analysis we conducted of Project Lead the Way (PLTW), one of the most highly rated and allegedly "expensive" CTE programs in the country. We presented our findings to Wyoming as part of the 2010 recalibration (Odden & Picus, 2010).

PLTW is a nationally recognized exemplar for secondary CTE. Often implemented jointly with local postsecondary education institutions and employer advisory groups, these programs usually feature project- or problem-based learning experiences, career planning and guidance services, and technical and/or academic skills assessments. Through hands-on learning, the programs are designed to develop the science, technology, engineering and mathematics (STEM) skills essential for achievement in the classroom and success in college or jobs not requiring a four-year college education. Today, PLTW is offered in more than 5,000 elementary, middle and high schools in all 50 states and enroll over 500,000 students.

The curriculum features rigorous, in-depth learning experiences delivered by certified teachers and end-of-course assessments. High-scoring students earn college credit recognized in more than 100 affiliated postsecondary institutions. Courses focus on engineering foundations (design, principles, and digital electronics) and specializations (e.g., architectural and civil engineering, bio-technical engineering) that provide students with career and college readiness competencies in engineering and science. Students need to take math through Algebra 2 in order to handle the courses in the program, which also meets many states' requirements for science and other mathematics classes.

The major cost areas for the program are in class size, professional development and computer technologies. Most programs recommend class sizes of 25, a figure larger than provided for high school students by the Legislative Model. The professional development and most of the computer technology costs are covered through the professional development and technology components of the EB Model. In most other states, these would be new costs but they are already embedded in the Wyoming school funding system. However, a few of the PLTW concentration areas require a one-time purchase of expensive equipment, which can be covered by the $9,623 per CTE teacher in the Legislative Model.

Resource Use Analysis

Analysis of CTE teaching positions is discussed in Element 5. In SY 2013-14, the Legislative Model allocated $2,907,703 to school districts for CTE supplies and equipment. School districts spent 54.1% of that amount, or $1,572,703. Three districts spent more than allocated, 44 less, and one had no allocation and did not report any expenditures.

Additional Analysis for the 2015 Recalibration

Both the EB and Legislative Models provide for equipment and materials costs for CTE courses, although there is a minor difference in the amounts. The EB Model provides for $9,829.59 per CTE teacher FTE and the Legislative Model provides for $9,361.46 per CTE teacher FTE. The amount provided is derived based upon amounts for equipment allowance, supply allowance and replacement allowance. The amounts for the two models are provided in Table 3.16. The reason for the variance is the EB Model amounts have been increased by an external cost adjustment (ECA) index each year since the 2010 recalibration and the Legislative Model amounts have been increased by the ECA provided for by the Legislature.

Table 3.16 CTE Equipment and Materials by Model

Category	Legislative Model	EB Model
CTE Equipment Allowance per CTE Teacher FTE	$1,804.10	$1,894.32
CTE Supply Allowance per CTE Teacher FTE	$6,655.99	$6,988.83
CTE Replacement Allowance per CTE Teacher FTE	$901.36	$946.43
Total Amount	**$9,361.46**	**$9,829.59**

As part of the 2015 recalibration effort, we consulted with the Wyoming liaison for PLTW and confirmed the personnel resources in the Legislative Model are more than adequate to provide PLTW programs. For equipment costs, we recommend continuing to provide $9,361.46 for each CTE teacher FTE for SY 2016-17. We further recommend providing a single amount and no longer break the amount out by equipment, supply and replacement allowance.

2015 Evidence-Based recommendation: Provide an amount equal to $9,361.46 per vocational education teacher FTE.

21. Extra Duty Funds/Student Activities

Elementary, middle and high schools typically provide an array of non-credit producing after-school programs, such as clubs, bands, sports, and other activities. Teachers supervising or coaching in these activities usually receive small stipends for these extra duties.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide an amount equal to $288.98 per ADM, inflated annually to $314.66.	Funded at grade-band level, by school. For grades K-5, provide an amount equal to $24.94 per student. For grades 6-	Provide a total level of funding equal to $314.66 per ADM, but utilize a per ADM amount for elementary schools and	($2,762,078)

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
	12, use inverse sliding scales based on student enrollment for grades 6-8 and grades 9-12. Grades 6-8 school funding levels range from $820.30 for 1 ADM and $211.94 per ADM for a school of 1,260 ADM. Grades 9-12 funding levels range from $2,114.58 for 1 ADM and $623.33 per ADM for a school of 1,260 ADM. Alternative schools receive an amount equal to $299.68 per ADM.	sliding scale amounts for middle and high schools, at reduced levels. For elementary grades, provide an amount equal to $23.62 per ADM. For middle and high schools, use inverse sliding scales based on ADM. Middle school funding levels range from $776.95 for 1 ADM and $200.74 per ADM for a school of 1,260 ADM. High school funding levels range from $2,002.82 for 1 ADM and $590.39 per ADM for a school of 1,260 ADM. For alternative schools, fund as any other school. Sixth grade elementary students funded using the elementary per ADM amount and ninth grade students included in the high school ADM for the schools they would attend.	

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Research shows, particularly at the secondary level, students engaged in student activities tend to perform better academically than students not so engaged (Feldman & Matjasko, 2005), although too much extra-curricular activity can be a detriment to academic learning (Committee on Increasing High School Students' Engagement and Motivation to Learn, 2004; Steinberg, 1996, 1997). Feldman and Matjasko (2005) found participation in interscholastic (as compared to intramural) sports had a positive impact for both boys and girls on: grades, postsecondary education aspirations, reducing dropout rates, lowering alcohol and substance abuse, and led to more years of schooling. The effect was particularly strong for boys participating in interscholastic football and basketball. One reason for these impacts is participation in interscholastic athletics placed students in new social groups that tended to have higher scholastic aspirations and those aspirations "rubbed off" on everyone. But the effects differed by race and gender, and were not as strong for African Americans.

During the past several years, the EB Model has allocated between $200 and $300 per pupil for student activities, including intramural sports. These figures are in line with average amounts spent on such activities in many states. However, Wyoming presents a special case because of its many small districts and schools, which face much higher costs in mounting interscholastic sports. Further, as the resource use analysis below shows, districts spend more on student activities than is currently provided in the Legislative Model. Therefore, this element was subject to a more formal recalibration.

Resource Use Analysis

School district expenditures have grown from $26,930,899 in SY 2006-07 to more than $38 million in SY 2013-14. In SY 2013-14 the Legislative Model allocated a total of $30,739,372 for student activities. Six districts spent less than allocated and the other 42 districts spent more than provided. Overall, districts spent 125.3% of the Legislative Model allocation or a total of $7,762,318 more. The Legislative Model allocation for student activities has declined slightly since SY 2009-10. This phenomenon is due to a function of school reconfigurations, where grades 6 and 9 students are no longer served in an elementary and middle school, respectively, which these grades generate funding as their own middle and high school under the Legislative Model parameters. We recommend a fix for this issue as part of our 2015 EB Model recommendation.

Additional Analysis for the 2015 Recalibration

The 2010 EB Model recommendation for student activities provided an amount equal to $288.98 per ADM, which has been inflated annually to $314.66. The Legislative Model relies on a per ADM amount for grades K-5 of $24.94 and set of grade band based per pupil funding levels for grades 6-8 and grades 9-12 that are inversely related to the number of students in each of those grade bands. Alternative schools are provided a per ADM amount of $299.68. The Legislative Model for school year 2015-16 provides an estimated average of $344.28 per ADM, but varies by school district based upon the varying levels of funding for grades 6-8 and grades 9-12.

At the July 2, 2015 business officer Stakeholder meeting, concern was expressed adequate resources for substitute teachers were not provided by the Legislative Model to fill in for coaches who travel to other locations for high school athletic activities, an issue which this discussion addresses. The allocation of substitute teachers for other instructional needs is included in Element 9.

There is an additional concern with the Legislative Model because of the way students in grades 6 and 9 are funded in some schools. Specifically, grade 6 students enrolled in an elementary school are funded at the rate of middle school students, but the funding is determined only on the number of grade 6 students in the school, providing a high marginal funding level for those grade 6 students. This also happens in middle schools where the grade 9 students are resourced at the increased high school level, but the pupil count for doing so is based only on the number of grade 9 students, again leading to a high marginal funding rate.

To recalibrate this element, we engaged a team of consultants to assist in determining the appropriate funding levels for student activities in Wyoming. The consultants approached this work by having one team member take the lead on each topic they considered while the others provided a peer review before it was submitted to us to develop final recommendations. The team consisted of four highly regarded school business officers, Claire Hertz, Jenifer Bolton Caris, Melissa deVita and Bill Sutter. Short biographies of each are provided in Appendix A. Claire Hertz was the consultant primarily responsible for assisting us on the student activities element.

Student Activities: Additional Research

As noted above, there is research demonstrating secondary students who participate in afterschool activities have higher academic outcomes, increased safety and higher participation in civic activities, while negative behaviors such as use of drugs and alcohol is reduced (Fredericks & Eccles, 2006).

Because of the positive outcomes on student performance, student activities are viewed by many as an integral component of a student's education. Across the country schools invest in student activities and students who participate in extracurricular activities from grades 8 to 12, attend college, vote in national and regional elections and volunteer at a higher rate (Zaff, et al., 2003). Wyoming has made student activities a priority by including an allocation in its school funding formula.

Wyoming's student activities formula provides resources for schools at all levels, with higher levels of per pupil funding in the higher-grade bands. The research that exists on student activities focuses mostly on high school level activities. However, we suggested in the 2005 recalibration that student activities, such as special interest clubs and intermural sports activities, are an important component of education at all levels, and recommended funding for activities in grades K-12. Both the 2010 EB Model recommendations and the Legislative Model provide funding for all grades. Although the 2010 EB Model recommendations provided a constant amount per student, we recognize spending will be much higher at the high school level to support the interscholastic athletic activities. Since the funds are provided in a block grant, districts would be able to make choices about the allocations among elementary, middle and high school levels.

Student Activities: Participation

A 2009 national survey asked high school seniors about their participation in high school activities including school newspaper, yearbook, music, performing arts, athletics, academic clubs (e.g. world language, science), student government and other school activities. The results of the survey can be viewed in Table 3.17. Student respondents indicated 38% participated in athletics, followed by other school activities at 32% and music and performing arts at 24%. There were differences in participation based on student gender. Female students participated in other school clubs at a rate of 40%, athletics 31% and music and performing arts 30%. Male students participated in activities in the following rates, athletics 46%, other social clubs 24%, music and performing arts 18%, other activities 12%.

Table 3.17 National High School Student Participation in Student Activities, 2009

Activity	Participation Rate (%)		
	Female	Male	Total
Newspaper Yearbook	11.30	5.80	8.70
Music Performing Arts	30.00	17.80	23.90
Athletics	31.40	46.00	38.40
Academic Clubs	16.50	11.60	14.00
Student Council	13.10	5.90	9.60
Other School Clubs	40.00	23.60	31.80

Source: Aud, et al. (2012).

Additional information on student participation is available at the state level through the National Federation of State High School Association (NFHS), an organization providing leadership for the administration of education-based interscholastic activities. NFHS surveyed state level organizations to collect athletic program participation rates based on high school competition in SY 2012-13. Table 3.18 summarizes the NFHS findings for Wyoming and surrounding states. NFHS found high school participation rates for Wyoming students are at about the median participation rate of the seven surrounding states. Data for other types of student activities are not available. The participation rates contained in Table 3.18 count an individual who participated in two sports twice, three sports three times, etc.

Table 3.18 High School Student Activity Participation Rates in Student Athletics for Wyoming and Surrounding States, SY 2012-13

State	Boys	Girls	Total	State Student Membership (1)	Athletics Participation as a % of State Student Membership
Wyoming	10,949	8,337	19,286	91,533	21.07%
Colorado	72,677	58,214	130,891	863,561	15.16%
Idaho	26,100	19,058	45,158	284,834	15.85%
Montana	17,902	13,844	31,746	142,908	22.21%
Nebraska	45,894	31,213	77,107	303,505	25.41%
South Dakota	16,195	11,857	28,052	130,471	21.50%
Utah	35,011	24,123	59,134	613,279	9.64%

Source: Survey conducted by National Federation of State High School Associations based on competition at the High School Level in the 2012-13 School Year http://www.nfhs.org/ParticipationStatics/PDF/2013-14%20NFHS%20Handbook_pgs52-70.pdf.
(1) Source: National Center for Education Statistics, Selected Statistics From the Public Elementary and Secondary Education Universe: School Year 2012–13; https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014098.

Student Activities: Expenditures

As noted in the resource use analysis information, Wyoming school districts currently spend more on student activities than allocated through the Legislative Model. Legislative Model provides an estimated $2.7 million more for student activities than the 2015 EB Model recommendation. The variable per pupil funding level provided through the Legislative Model provided an average of $332.68 per ADM for SY 2013-14. School districts spent an average of $422.50 per ADM in SY 2013-14. Table 3.19 displays student activity funding and expenditures for all Wyoming school districts from 2006-07 through 2013-14.

Table 3.19 Legislative Model Student Activity Resources Compared to Actual Expenditures, SY 2006-07 through SY 2013-14

School Year	Legislative Model Funding	Actual Expenditures	Difference	Actual as a Percent of Model Funding
2006-07	$28,987,467	$26,930,899	-$2,056,568	92.9%
2007-08	$29,890,778	$29,885,921	-$4,857	100.0%
2008-09	$30,973,403	$32,909,637	$1,936,234	106.3%
2009-10	$32,035,068	$34,839,445	$2,804,377	108.8%
2010-11	$31,942,444	$36,074,778	$4,132,334	112.9%
2011-12	$31,583,616	$37,171,354	$5,587,738	117.7%
2012-13	$31,180,443	$37,730,125	$6,549,682	121.0%
2013-14	$30,739,372	$38,501,667	$7,762,295	125.3%

Source: WDE CRERW report, October 2014.

At the July 2, 2015 business officer Stakeholder meeting, participants indicated hotel fees and official's fees for student athletic activities have increased significantly. Historically, districts would spend about $70 per room per night compared to the current $119 to $129 per room per night due to the expansion of the oil and natural gas industry and the increase in tourism as the economy has recovered. Annual statewide hotel room occupancy rates have increased confirming the hotel expense information from district officials (Storrow, 2015). Transportation expenses are not included in the costs as they are reimbursed 100% under the Legislative Model, and as a result do not contribute to the increased costs districts claim they are experiencing. As business officers review coding of expenses for student activities, some districts have not included expenditures for administrative oversight, security and substitutes for staff traveling to competitions.

Stakeholders also expressed concern there are inadequate resources to provide substitute teachers for coaches who need to leave school during the day to coach athletic activities. Unfortunately, few districts code expenditures in a way that allows them to distinguish whether substitutes are used to replace a teacher for illness or because they participated in a professional development activity or if the substitute was used to replace a teacher coach with athletic team responsibilities. Moreover, data are not available to ascertain whether or not districts are spending all of their substitute resources generated through the Legislative Model.

Table 3.20 compares Wyoming's student activities expenditures with those of the surrounding states in 2012-13. The table shows that Wyoming's activity expenditures are the highest among the surrounding states, and are more than $100 per pupil above the expenditures in Nebraska (a state with numerous small school districts), the second highest per pupil spending state. The EB Model for the 2012-13 school year would have provided $298.26 per student, exceeding the highest surrounding state in the region, Nebraska, by $7.60.

Table 3.20 Student Activity Expenditures Per Pupil, SY 2012-13

State	Total Student Activities Expenditures	Student Membership	Student Activities Expenditures per ADM	Notes
Wyoming	$37,730,125	91,533	$412.20	(1)
Colorado	$237,610,879	863,561	$275.15	(2)
Idaho	$26,124,128	284,834	$91.72	(3)
Montana	$37,082,446	142,908	$259.48	(4)
Nebraska	$88,217,585	303,505	$290.66	(5)
South Dakota	$35,002,841	130,471	$268.28	(6)
Utah	$115,501,624	613,279	$188.33	(7)

Notes: (1) WDE CRERW report, October 2014.

(2) Colorado Department of Education, Fiscal Year 2012-13 District Revenues and Expenditures, http://www.cde.state.co.us/cdefinance/fy12-13revexp.

(3) Idaho State Department of Education, Statewide Summary Combined Statement of Revenues, Expenditures and Changes in Fund Balance, https://www.sde.idaho.gov/site/statistics/docs/financial_summaries/12_13/Statewide.pdf.

(4) Montana Office of Public Instruction, Reported Expenditures by School District, http://gems.opi.mt.gov/SchoolFinance/Pages/ReportedExpenditureBySchoolDistrict.aspx.

(5) Nebraska Department of Education, Annual Financial Report - Statewide, http://www.education.ne.gov/FOS/ASPX/AFR/AFRStatewide.aspx?datayear=2012/13&id=2.

(6) South Dakota Department of Education, Statewide Annual Financial Report, http://doe.sd.gov/ofm/documents/FY13StTtl.pdf.

(7) Utah State Office of Education, Superintendent's Annual Report - Total Statewide Revenue and Expenditures by Fund, http://www.schools.utah.gov/data/Superintendents-Annual-Report/AR-2012-2013/StatewideFund.aspx.

Student Activities: Funding

Our research did not find a common model for allocating state support for student activities or a model that recognizes the higher costs faced by small schools and districts. As shown in Table 3.20, we did find Wyoming school districts are spending more per pupil on student activities than any other state in the region. Our 2015 EB Model recommendation is to use the inflated 2010 EB Model recommendation per student amount of $314.66. Our recommendation of $314.66 per pupil is adequate to provide a strong student activities program, and believe it would be appropriate to distribute it by a per ADM amount to school districts. However, we also recognize variable funding levels provided in the Legislative Model are important to school leaders in the Wyoming context. If the Legislature wants to continue a variable funding approach at the middle and high school levels based on school size, we recommend it reduce the per pupil revenue at each enrollment level such that the total funding remains the same as if activities were funded as a flat grant to districts.

The most straightforward way to do this is to reduce the funding within the Legislative Model uniformly. The 2015 EB Model recommendation is equal to 91.4% of the Legislative Model funding level. We recommend the Legislative Model amounts be reduced to 91.4% of current levels, but retain the same parameters: flat per student amount at elementary schools and variable amounts for middle and high schools based upon school enrollment. If distributed as a per ADM amount, it would shift funds from small districts to large districts. By using a reduced level of the current variable funding scheme, all districts would lose some funding, but total funding would equal the 2015 EB Model recommendation.

Student Activities: Fixing the Grade 6 and Grade 9 Issue

If the Legislature elects to continue using the Legislative Model funding scheme at either the current funding level or at the 2015 EB Model funding level, we recommend adjustments that minimize the grades 6 and 9 “bumps” in funding. Specifically, for the grade 6 students enrolled in an elementary school, we recommend they be counted as elementary students and funded using the flat ADM funding level. Our assumption is the grade 6 elementary students will participate in their elementary school activities and should be funded as such. For grade 9 students in middle schools, there is evidence many districts encourage these students to participate in high school activity programs. If the Legislative Model structure continues to be used, we recommend the grade 9 students in middle schools be funded at high school levels, but be added to the high school enrollment to determine the per student allocation. Depending on the size of the affected middle and high school, this will reduce the middle school funding generated students in grade 9 and increase funding at the high school level.

Student Activities: Summary

Wyoming provides substantially more funding per student for student activities than any of the surrounding states. School districts in Wyoming spend more money than generated through the Legislative Model, and consequently more per pupil than any of the surrounding states. Further, while the 2005 recalibration increased funding for student activities, over the next ten years Wyoming districts increased school activities expenditures beyond the additional funding provided and above inflationary increases. Stakeholders claim additional resources are needed to provide adequate funding for substitute teachers and to cover growing travel costs. Unfortunately, data to adequately assess these claims are not available in a consistent framework.

Our recommendation is the 2015 EB Model amount of $314.66 per student is adequate to support student activity costs faced by school districts and to cover the costs of a comprehensive student activities program at all grade levels. This recommendation remains higher than the per pupil spending for activities in any of the surrounding states. Further, the Legislative Model provides a logical structure through which these resources should be allocated to districts, recognizing the higher activity costs faced by smaller districts. Wyoming's high funding level suggests efficiencies in the design of athletic programs and schedules, as well as more judicious use of substitute time to replace coaching activity, will enable districts to reduce activity costs in the future.

2015 Evidence-Based recommendation: Provide a total level of funding equal to $314.66 per ADM, but utilize a flat per ADM amount for elementary schools and sliding scale amounts for middle and high schools, at reduced levels. For elementary grades, provide an amount equal to $23.62 per ADM. For middle and high schools, use inverse sliding scales based on ADM. Middle school funding levels range from $776.95 for one ADM and $200.74 per ADM for a school of 1,260 ADM. High school funding levels range from $2,002.82 for one ADM and $590.39 per ADM for a school of 1,260 ADM. For alternative schools, fund as any other school. Additionally, grade 6 elementary students should be funded using the elementary per ADM amount and grade 9 students should be included in the high school ADM for the schools they would attend.

CENTRAL OFFICE FUNCTIONS

In addition to school level resources, education systems also need resources for district level expenditures including operations and maintenance, the central office and transportation. These are outlined below.

22. Operations and Maintenance

Computation of operations and maintenance costs is complicated by the lack of a strong or consistent research base. Some school finance models allocate a percentage of current expenditures to operations and maintenance. The EB Model uses formulas to compute the number of personnel needed for custodial, maintenance and grounds work and the Legislative Model has used those formulas to estimate staffing for operations and maintenance costs since the 2005 recalibration. Additionally, funding is provided for utilities.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
<u>Custodian Positions</u>: Calculated on the basis of four factors: 1) number of model generated teachers; 2) school ADM; 3) number of classrooms as reported by the School Facilities Department (SFD); and 4) the lesser of	<u>Custodian Positions</u>: Calculated on the basis of four factors: 1) number of model generated teachers; 2) school ADM; 3) number of classrooms as reported by the School Facilities Department (SFD); and 4) the lesser of	<u>Custodian Positions</u>: Calculated on the basis of four factors: 1) number of model generated teachers; 2) school ADM; 3) number of classrooms as reported by the School Facilities Department (SFD); and 4) the lesser of	-17.81 FTEs, ($921,751) *Note: Differences are due to class sizes which generate teachers, which are then used in*

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
actual educational gross square footage (GSF) or SFD allowable educational GSF adjusted up by 115%. These four factors are added together and divided by four to arrive at the preliminary FTE. The factor for each of these components is derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich (13 teachers standard; 325 ADM standard; 13 classrooms standard; 18,000 GSF standard). This base FTE is further adjusted by an additional 0.5 FTE for secondary schools. Small schools do not generate custodial FTE positions. Custodian FTEs for non-educational buildings are based solely on the GSF factor, which is limited to 10% of a district's total allowable educational GSF divided by the Zureich factor (18,000 GSF). <u>Maintenance Worker Positions</u>: Calculated on the basis of four factors: 1) building; 2) the lesser of actual educational GSF or SFD allowable educational GSF adjusted up by 115%; 3) school ADM; and 4) FY 2006 GF operating expenditures. These four FTE factors are added together and divided by four to arrive at a base FTE. The factor for each of these components is	actual educational gross square footage (GSF) or SFD allowable educational GSF adjusted up by 115%. These four factors are added together and divided by four to arrive at the preliminary FTE. The factor for each of these components is derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich (13 teachers standard; 325 ADM standard; 13 classrooms standard; 18,000 GSF standard). This base FTE is further adjusted by an additional 0.5 FTE for secondary schools. Small schools do not generate custodial FTE positions. Custodian FTEs for non-educational buildings are based solely on the GSF factor, which is limited to 10% of a district's total allowable educational GSF divided by the Zureich factor (18,000 GSF). <u>Maintenance Worker Positions</u>: Calculated on the basis of four factors: 1) building; 2) the lesser of actual educational GSF or SFD allowable educational GSF adjusted up by 115%; 3) school ADM; and 4) FY 2006 GF operating expenditures. These four FTE factors are added together and divided by four to arrive at a base FTE. The factor for each of these components is	actual educational gross square footage (GSF) or SFD allowable educational GSF adjusted up by 115%. These four factors are added together and divided by four to arrive at the preliminary FTE. The factor for each of these components is derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich (13 teachers standard; 325 ADM standard; 13 classrooms standard; 18,000 GSF standard). This base FTE is further adjusted by an additional 0.5 FTE for secondary schools. Small schools do not generate custodial FTE positions. Custodian FTEs for non-educational buildings are based solely on the GSF factor, which is limited to 10% of a district's total allowable educational GSF divided by the Zureich factor (18,000 GSF). <u>Maintenance Worker Positions</u>: Calculated on the basis of four factors: 1) building; 2) the lesser of actual educational GSF or SFD allowable educational GSF adjusted up by 115%; 3) school ADM; and 4) FY 2006 GF operating expenditures. These four FTE factors are added together and divided by four to arrive at a base FTE. The factor for each of these components is	*the custodial formulae.* -3.32 Maintenance Worker FTEs, ($197,126)

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich: 1.10 building factor; 60,000 GSF standard and a 1.20 factor; 1,000 ADM standard and 1.30 factor; $5 million standard and 1.20 factor). The base number is further adjusted for 1) school level (base FTE is multiplied by 0.80 for elementary schools, 1.0 for middle schools, and 2.0 for high schools); 2) building age where schools under 10 years old are multiplied by a factor of 0.95 and over 30 years old by a factor of 1.10; and 3) small district size where FTE are multiplied by a factor of 1.10 for under 1,000 ADM. It is assumed that the maintenance worker FTEs determined on the basis of a district's total allowable educational GSF for schools are sufficient to service all buildings in a district, both educational and non-educational.	derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich: 1.10 building factor; 60,000 GSF standard and a 1.20 factor; 1,000 ADM standard and 1.30 factor; $5 million standard and 1.20 factor). The base number is further adjusted for 1) school level (base FTE is multiplied by 0.80 for elementary schools, 1.0 for middle schools, and 2.0 for high schools); 2) building age where schools under 10 years old are multiplied by a factor of 0.95 and over 30 years old by a factor of 1.10; and 3) small district size where FTE are multiplied by a factor of 1.10 for under 1,000 ADM. It is assumed that the maintenance worker FTEs determined on the basis of a district's total allowable educational GSF for schools are sufficient to service all buildings in a district, both educational and non-educational.	derived by finding the ratio of a school's actual data to adequacy standards reported by Zureich: 1.10 building factor; 60,000 GSF standard and a 1.20 factor; 1,000 ADM standard and 1.30 factor; $5 million standard and 1.20 factor). The base number is further adjusted for 1) school level (base FTE is multiplied by 0.80 for elementary schools, 1.0 for middle schools, and 2.0 for high schools); 2) building age where schools under 10 years old are multiplied by a factor of 0.95 and over 30 years old by a factor of 1.10; and 3) small district size where FTE are multiplied by a factor of 1.10 for under 1,000 ADM. It is assumed that the maintenance worker FTEs determined on the basis of a district's total allowable educational GSF for schools are sufficient to service all buildings in a district, both educational and non-educational.	
Groundskeeper Positions: Determined at the site rather than building/program level. The number of FTEs for all sites, both educational and non-educational, is based on the number of acres of the site and the standard for the number of annual work hours per acre (93 hours). The FTE calculation assumes a 2,008 hour work year for	Groundskeeper Positions: Determined at the site rather than building/program level. The number of FTEs for all sites, both educational and non-educational, is based on the number of acres of the site and the standard for the number of annual work hours per acre (93 hours). The FTE calculation assumes a 2,008 hour work year for	Groundskeeper Positions: Determined at the site rather than building/program level. The number of FTEs for all sites, both educational and non-educational, is based on the number of acres of the site and the standard for the number of annual work hours per acre (93 hours). The FTE calculation assumes a 2,008 hour work year for	$0

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
groundskeepers. The initial FTE is adjusted for the primary school level or use of the site, with non-educational and elementary school sites received no additional adjustment, middle school sites receiving an adjustment factor of 1.5 and high school sites an adjustment factor of 2.5. Groundskeeper FTE calculations for acreage acquired by a district after July 1, 1997, are based upon the lesser of the actual site acreage on which the facility is situated or the SFD/SFC guidelines: elementary schools (four acres plus one acre for every 100 ADM); middle schools (10 acres plus one acre for every 100 ADM; high schools (20 acres plus one acre for every 100 ADM). In instances where districts acquired acreage after July 1, 1997 through an exchange of land with another government entity, and the acreages involved in the exchange were originally acquired by the district and the government entity on or before July 1, 1997, the acreage is not subject to the SFC guidelines. The entire acreage will be used in the calculation of groundskeeper FTEs. If a district has acquired a site after July 1, 1997, and the site is without a facility situated on it or has a facility under construction,	groundskeepers. The initial FTE is adjusted for the primary school level or use of the site, with non-educational and elementary school sites received no additional adjustment, middle school sites receiving an adjustment factor of 1.5 and high school sites an adjustment factor of 2.5. Groundskeeper FTE calculations for acreage acquired by a district after July 1, 1997, are based upon the lesser of the actual site acreage on which the facility is situated or the SFD/SFC guidelines: elementary schools (four acres plus one acre for every 100 ADM); middle schools (10 acres plus one acre for every 100 ADM; high schools (20 acres plus one acre for every 100 ADM). In instances where districts acquired acreage after July 1, 1997 through an exchange of land with another government entity, and the acreages involved in the exchange were originally acquired by the district and the government entity on or before July 1, 1997, the acreage is not subject to the SFC guidelines. The entire acreage will be used in the calculation of groundskeeper FTEs. If a district has acquired a site after July 1, 1997, and the site is without a facility situated on it or has a facility under construction,	groundskeepers. The initial FTE is adjusted for the primary school level or use of the site, with non-educational and elementary school sites received no additional adjustment, middle school sites receiving an adjustment factor of 1.5 and high school sites an adjustment factor of 2.5. Groundskeeper FTE calculations for acreage acquired by a district after July 1, 1997, are based upon the lesser of the actual site acreage on which the facility is situated or the SFD/SFC guidelines: elementary schools (four acres plus one acre for every 100 ADM); middle schools (10 acres plus one acre for every 100 ADM; high schools (20 acres plus one acre for every 100 ADM). In instances where districts acquired acreage after July 1, 1997 through an exchange of land with another government entity, and the acreages involved in the exchange were originally acquired by the district and the government entity on or before July 1, 1997, the acreage is not subject to the SFC guidelines. The entire acreage will be used in the calculation of groundskeeper FTEs. If a district has acquired a site after July 1, 1997, and the site is without a facility situated on it or has a facility under construction,	

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
groundskeeper FTEs will not be generated for the acreage.	groundskeeper FTEs will not be generated for the acreage.	groundskeeper FTEs will not be generated for the acreage.	
Supplies and Materials: Funding for O&M supplies is calculated at a rate of $0.64 per GSF for both educational and non-educational space, inflated annually to $0.70. For educational space, GSF is equal to the lesser of actual educational GSF or allowable educational GSF adjusted up by 115%. Funding for non-educational space is equal to 10% of a district's total allowable educational GSF.	Supplies and Materials: Funding for O&M supplies is calculated at a rate of $0.67 per GSF for both educational and non-educational space. For educational space, GSF is equal to the lesser of actual educational GSF or allowable educational GSF adjusted up by 115%. Funding for non-educational space is equal to 10% of a district's total allowable educational GSF.	Supplies and Materials: Funding for O&M supplies is calculated at a rate of $0.67 per GSF for both educational and non-educational space. For educational space, GSF is equal to the lesser of actual educational GSF or allowable educational GSF adjusted up by 115%. Funding for non-educational space is equal to 10% of a district's total allowable educational GSF.	$0
Utilities: Funding for utilities is based on actual FY 2009-10 district expenditures as reported by the WDE (expenditure functions 3410-3450 & 3490 Only; Objects 451-459 plus communications - object 340, excluding special education functions 1210 & 2230 and student transportation functions 3510 & 3520) inflated annually. For additional school buildings added (not replacement schools) to a school district's building inventory after school year 2009-10, multiply the average GSF cost as adjusted by the ECA by the total GSF (lesser of actual or SFD allowable) for the new buildings to provide additional utility resources	Utilities: Funding for utilities is based on actual FY 2009-10 district expenditures as reported by the WDE (expenditure functions 3410-3450 & 3490 Only; Objects 451-459 plus communications - object 340, excluding special education functions 1210 & 2230 and student transportation functions 3510 & 3520) as adjusted by the ECA enacted by the Legislature. For additional school buildings added (not replacement schools) to a school district's building inventory after school year 2009-10, multiply the average GSF cost as adjusted by the ECA by the total GSF (lesser of actual or SFD allowable) for the new buildings to provide additional utility resources	Utilities: Funding for utilities is based on actual FY 2009-10 district expenditures as reported by the WDE (expenditure functions 3410-3450 & 3490 Only; Objects 451-459 plus communications - object 340, excluding special education functions 1210 & 2230 and student transportation functions 3510 & 3520) as adjusted by the ECA enacted by the Legislature. For additional school buildings added (not replacement schools) to a school district's building inventory after school year 2009-10, multiply the average GSF cost as adjusted by the ECA by the total GSF (lesser of actual or SFD allowable) for the new buildings to provide additional utility resources	$0

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
for the new GSF.	for the new GSF.	for the new GSF.	

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Drawing on professional standards in the field as well as research, we have recently conducted analyses of the cost basis for maintenance and operations (e.g., Picus & Odden, 2010; Picus & Seder, 2010). The discussion below summarizes our research on operations and maintenance, identifying the needs for custodians (school level), maintenance staff (district level) and groundskeepers (school and district level), as well as the costs of materials and supplies to support these activities.

Custodians

Custodians are responsible for the daily cleaning of classrooms and hallways as well as for routine furniture set ups and takedowns. In addition, custodians often manage routine and simple repairs like minor faucet leaks, and are expected to clean cafeterias/multipurpose rooms, lockers and showers. Custodial workers' duties are time-sensitive, are structured and varied. Zureich (1998) estimates the time devoted to various custodial duties:

- Daily duties (sweep or vacuum classroom floors; empty trash cans and pencil sharpeners in each classroom; clean one sink with faucet; and, security of room), which take approximately 12 minutes per classroom.
- Weekly duties (dust reachable surfaces; dust chalk trays and clean doors; clean student desk tops; clean sink counters and spots on floors; and, dust chalk/white boards and trays), each of which adds five minutes a day per classroom.
- In addition to these services, non-cleaning services (approximately 145 minutes per day) provided by custodians include: opening school (checking for vandalism, safety and maintenance concerns), playground and field inspection, miscellaneous duties (teacher/site-manager requests; activity set-ups; repairing furniture and equipment; ordering and delivering supplies), and putting up the flag and physical education equipment.

A formula that was developed to consider these cleaning and non-cleaning duties was updated by Nelli (2006). The formula takes into account teachers, students, classrooms and gross square feet (GSF) in the school. The formula is:

- One custodian for every 13 teachers, plus
- One custodian for every 325 students, plus
- One custodian for every 13 classrooms, plus
- One custodian for every 18,000 allowable GSF[15], and
- The total divided by four to calculate a base FTE school level custodian position.

This base FTE position is further adjusted by an additional 0.5 FTE for secondary schools. Schools with 49 or fewer ADM do not generate custodial FTE positions. Custodian positions for non-educational

[15] Allowable GSF is the lesser of actual educational GSF or the School Facilities Department's allowable educational GSF adjusted up by 115%.

buildings are based solely on the GSF factor, which is limited to 10% of a district's total allowable educational GSF divided by the Zureich factor (18,000 GSF).

The formula calculates the number of custodians needed at prototypical schools and the district. The advantage of using all four factors for the school custodians is it accommodates growth or decline in enrollment and continues to provide the school with adequate coverage for custodial services over time.

Maintenance Workers

Maintenance workers function at the district level, rather than at individual schools. Core tasks provided by maintenance workers include preventative maintenance, routine maintenance and emergency response activities. Individual maintenance worker accomplishment associated with core tasks are (Zureich, 1998):

- HVAC systems, HVAC equipment, and kitchen equipment;
- Electrical systems, electrical equipment;
- Plumbing systems, plumbing equipment; and
- Structural work, carpentry and general maintenance/repairs of buildings and equipment.

Zureich recommends a formula for maintenance worker FTEs incorporated into the funding model for instructional facilities as follows:

- Calculated on the basis of four factors:
    - An initial 1.10 maintenance worker FTE, plus
    - One maintenance worker for every 60,000 allowable educational GSF at factor of 1.2, plus
    - One maintenance worker for every 1,000 School ADM at factor of 1.3, plus
    - One maintenance worker for every $5 million of general fund operating expenditures from SY 2005-06 at a factor of 1.2.
- These four FTE factors are added together and divided by four to arrive at a base maintenance worker FTE.
- The base FTE is further adjusted for:
    - School level (base FTE is multiplied by 0.80 for elementary schools, 1.0 for middle schools, and 2.0 for high schools);
    - Building age, where schools under 10 years old are multiplied by a factor of 0.95 and over 30 years old by a factor of 1.10; and
    - Small district size where the base FTE is multiplied by a factor of 1.10 for districts with ADM under 1,000.

It is assumed the maintenance worker FTEs determined on the basis of a district's total allowable educational GSF for schools are sufficient to service all buildings in a district, both educational and non-educational.

Groundskeeper Positions

The typical goals of a school grounds maintenance program are generally to provide safe, attractive, and economical grounds maintenance (Mutter & Randolph, 1987). This, too, is a district level function. We have estimated an elementary school needs 62 days per years of groundskeeper support, a middle school

140 days and a high school 388 days per year. Groundskeepers are determined at the site rather than building/program level.

The number of groundskeepers for all sites, both educational and non-educational, is based on the following:

- The number of acres of the site and the standard for the number of annual work hours per acre (93 hours). The FTE calculation assumes a 2,008 hour work year for groundskeepers.
- The initial FTE is adjusted for the primary school level or use of the site, with non-educational and elementary school sites received no additional adjustment, middle school sites receiving an adjustment factor of 1.5 and high school sites an adjustment factor of 2.5.
- The Legislative Model has added additional requirements for groundskeeper FTE calculations for acreage acquired by a district after July 1, 1997. These sites' acreage are based upon the lesser of the actual site acreage on which the facility is situated or the School Facilities Department's (SFD) guidelines:
    - Elementary schools, four acres plus one acre for every 100 ADM;
    - Middle schools 10 acres plus one acre for every 100 ADM; and
    - High schools, 20 acres plus one acre for every 100 ADM.
    - In instances where districts acquired acreage after July 1, 1997 through an exchange of land with another government entity, and the acreages involved in the exchange were originally acquired by the district and the government entity on or before July 1, 1997, the acreage is not subject to the SFD guidelines. The entire acreage will be used in the calculation of groundskeeper FTEs. If a district has acquired a site after July 1, 1997, and the site is without a facility situated on it or has a facility under construction, groundskeeper FTEs will not be generated for the acreage.

Supplies and Materials

Maintenance and custodial supplies were estimated at a rate of $0.64 per GSF during the 2010 recalibration for both educational and non-educational space, inflated annually to $0.70. The Legislative Model uses an amount equal to $0.67 per GSF and we believe this amount is adequate and for purposes of our 2015 EB Model recommendation. For educational space, GSF is equal to the lesser of actual educational GSF or allowable educational GSF adjusted up by 115%. Funding for non-educational space is equal to 10% of a district's total allowable educational GSF.

Utilities

The Legislative Model's current funding formula accounts for utility expenses by assessing the actual expenditures on utilities in a base year and adjusting the base by an inflation factor and adding new school square footage for utility expenditures. In SY 2013-14, on average school districts spent 10.9% more than was allocated for utilities. This would indicate utility costs have been rising somewhat faster than the inflationary factor the formula uses. It is not clear if this is a function of the actual inflation factor used, or a result of the Legislature not always enacting an ECA. One other possibility for this overspending on utilities may be the result of new spaces being opened as new facilities are completed, or possibility even the temporary use of additional utilities during construction. Our 2015 EB Model recommendation is to maintain the current funding approach to utilities and ensure the ECA to utilities is implemented annually to enable the funding to match actual utility costs as closely as possible, whether they increase or decrease.

Resource Use Analysis

The CRERW report combines district expenditures for operations and maintenance and operations staff with expenditures for operations and maintenance supplies and equipment because it was hard to separate the two in district reports, and in many cases districts contract for some of these services so staff and spending comparisons across districts are impossible.

For SY 2013-14, the Legislative Model allocated $93,511,030 to school districts for maintenance and operations; school districts spent 97.8% of the amount allocated or $91,464,230. Fourteen districts spent more than the model allocation, with the largest overspending amounting to 132.1% of the allocation. The remaining 34 districts spent less than the model allocation, with the lowest ratio of spending to model allocation being 57.9%.

Utilities are funded on the basis of actual utility expenditures in a base year adjusted by an inflation factor, recently one focused specifically on the cost of utilities. For S2013-14, total allocations for utilities were $37,781,456. Districts spent $3,704,348 more than allocated or 110.9%. Thirty districts spent more than allocated, with one district spending 149.7% of its utility allocation, while 18 districts spent less than, with one spending 87.1% of its allocation.

Additional Analysis for 2015 Recalibration

As discussed above, the EB Model and the Legislative Model use the same formulas to compute the resources for custodial, maintenance and groundskeepers, with minor adjustments to the Legislative Model for acreage used in the groundskeeper formula. Our 2015 EB Model recommendation is to maintain the current funding approach in the Legislative Model for utilities since there has been a slight divergence due to the application of the annual ECA in the EB Model.

The research evidence linking the operations and maintenance of schools directly to student performance is both limited and mixed. Even without a strong basis to support the linkage between facility quality and student outcomes, all students are entitled to attend schools in a safe, clean and well-maintained environment. Further, the Wyoming Supreme Court's *Campbell* decisions affirm the importance of adequate school facilities, and the State has spent a great deal of effort and money to construct new school buildings or renovate existing buildings. The importance of operating and maintaining this investment is clear regardless of the strength of the relationship between them.

The approach used in the EB Model was developed for Wyoming during the 2005 recalibration and reviewed during the 2010 recalibration. It provides school and district based custodial positions, district based maintenance positions and district based groundskeeper positions. We sought to recalibrate this element in the 2015 recalibration, but in the process learned that there is little if any new evidence, so our recommendations for funding operations and maintenance have not changed.

Review of Literature and Recent Studies of Wyoming Operations and Maintenance

We employed the same process and group of consultants to review this element as student activities (Element 21). Consultants reviewed available studies that consider the linkage between student performance and operations and maintenance and/or facility quality. Earthman (2002) noted the importance of school facility conditions as researchers have consistently found a difference of between 5 and 17 percentile points in performance of students in buildings that are poorly maintained compared to students in standard buildings. Interestingly, correlations were also documented that show teacher effectiveness decreases in schools with poor facilities. The information presented cited not only the importance of clean, maintenance free buildings but also the quality of the thermal and acoustic materials in the environment where students are learning.

In similar work completed by The Tennessee Advisory Commission on Intergovernmental Relations (Young, et. al., 2003), research shows a statistically significant relationship between the condition of a school or classroom with student achievement. Students attending schools in up to date facilities score higher on standardized tests than those in substandard buildings. The committee concluded policy makers should be thinking about the relationship between school facilities and student learning outcomes, not only because of safety and welfare responsibilities to the students and staff, but also because a lack of adequate funding for facilities repair and maintenance can undermine spending in other areas focused on educational reform.

Young, et. al. showed positive educational outcomes were correlated with the following factors:

- New facilities,
- Well-maintained buildings,
- Thermal regulations to avoid excessive temperatures,
- Appropriate lighting levels,
- Utilizing relaxing shades of paint, and
- Limited external noise.

Contrary to this, Picus, Marion, Calvo and Glenn (2005) studied the correlation between the quality of Wyoming school facilities and student outcomes. School quality was measured with a 100 point scale developed specifically for Wyoming schools and used to assess every school. These scores were correlated with measures of student outcome and no statistically significant relationship was found. While this finding does not mean the State should abandon its efforts to provide safe, clean and well maintained facilities, the expectation that those resources should be expected to improve student performance significantly should modest.

We reviewed two draft reports related specifically to the funding of school facilities in Wyoming submitted to the Select Committee on School Facilities. Both reports were prepared by the SFD with the assistance of the 21st Century School Fund.

The first publication titled "Strengthening Wyoming Schools and Our Communities" describes the efforts Wyoming has made in both school construction and major maintenance of school facilities since the first *Campbell* ruling. The report states the State has made great progress in improving the quality of school facilities and identifies 32 more schools in need of replacement or major improvements, with 14 of the schools currently scheduled to receive funding through the major capital construction program for planning or design.

The second report, "Now and for the Future: Adequate and Equitable K-12 Facilities in Wyoming" reviewed the investments in capital improvements over the last 15 years and made recommendations about funding for school facilities into the future. The report notes a change in the way in which funds are used to support schools in this area may be needed, suggesting Wyoming should continue to provide districts with predictable and adequate funding to allow schools to meet facilities requirements, focusing on *asset preservation* as opposed to diverting large sums of money for large *capital construction and renovation* remedies. The report suggests current funding for major maintenance should be used in concert with the routine maintenance funding through the Legislative Model.

The second report also states there are significant differences between the amount generated by Legislative Model for operations and maintenance and what districts spend. The report suggests district spending for operations and maintenance is higher than funded and concludes in many instances salary levels in the Legislative Model are lower than those paid by the school districts. In our view, the CRERW report showed spending patterns are more reliable estimates of the adequacy of funding for operations and maintenance, and suggest the EB Model accurately reflects operations and maintenance costs.

In addition to these reports, a group of school business leaders prepared a “white paper” outlining several issues related to operations and maintenance funding. The school leaders commend the State for its investment in school facilities, but also highlight what they describe as the added burden to districts to operate and maintain facilities with modern, technology enhanced, sophisticated control systems. They note modern buildings are complex, with the use of automated equipment increasing, requiring additional preventative maintenance performed by highly skilled staff. An additional level of expertise and training is required to support the new buildings, which often translates into a need to hire a specialized staff such as licensed electricians, plumbers or HVAC technicians at higher salaries than the previous custodians, maintenance workers and groundskeepers. The white paper states schools are struggling to recruit and retain needed staff to perform the work under the current funding levels in the Legislative Model.

The white paper also identifies a concern expressed during the July 2, 2015 stakeholder meeting, asserting many districts appear to hire fewer operation and maintenance positions than are funded. In many instances, the authors of the white paper state, districts choose to contract for specific work rather than hire their own staff. Given the increasing need for advanced skills for maintenance and repair of newer facilities, this approach makes sense, and the operational question in our view is whether the funding level for operations and maintenance is adequate, regardless of the choice of made between district employees and contracted services.

Today, the challenge districts face is to maintain their facilities so the buildings and grounds will serve the needs of students for a long time, and to ensure their operations are efficient and cost effective. Despite extensive research, we are unable to find examples of funding formulas for operations and maintenance that are different from the ones we recommended in 2005 and continue to recommend.

We note while there is variation across districts in terms of how spending compares to resources generated by the Legislative Model, overall districts are spending 98% of the resources generated, which suggests the funding levels are generally on target. There are several issues that should be continually reviewed going forward as the State assesses how school districts use funding for operations and maintenance.

Staffing v. Contracting

The data from the CRERW report indicate schools have increased staffing levels by 5.4% over the last six years, which does not include additional contracted services. In addition, actual expenditures in salary and benefits are over spent by 8%, even when the staff FTE is reported as below the recommended FTE levels. In many instances (often confirmed by Wyoming specific reports) districts use contracted services instead of employees to complete operations and maintenance work. Although this leads to the apparent use of fewer staff than resourced in the Legislative Model, we continue to recommend the use of staffing patterns as the basis of the formula for operations and maintenance, and local decisions regarding the use of contractors instead of staff should not lead to reductions in either the EB or Legislative Models’ staffing levels.

Other Cost Savings

The following options are recommended to enhance the data available for operations and maintenance, and to help increase operational efficiencies in operations and maintenance departments of school districts. District expenditures could be reported with more detailed categories in place. For example, salary and benefits and total FTE reports by title – custodians, maintenance workers (carpenters, plumbers, electricians, HVAC engineers, etc.) and groundskeepers – would be helpful for future analysis. Also, the comparisons of contractual expenses and consumable supply costs should be reported separately to allow for some comparisons by regions or size. Districts can also look for ways to implement shared services to maximize the investment in staff, training and equipment. While the size and scarcity of the population of Wyoming present many challenges to shared services, if systems between districts could be standardized, it is possible highly skilled, hard to recruit staff could be paid slightly more, yet serve multiple schools or districts. Also very expensive equipment, which is not needed daily, could be used by multiple schools or districts. This could reduce overall costs by districts and reduce the overall funding requirements.

2015 Evidence-Based recommendation: Continue with current EB Model Legislative Model formulas for custodians, maintenance workers, groundskeepers and utilities.

23. Central Office Staffing/Non-Personnel Resources

All districts require central office staff to meet the overall management needs of the educational programs. Determining an adequate staffing level for very small districts is challenging, and in the past, the Legislative Model has been relatively generous in the number of staff it provides. In other states, we have developed staffing models using a prototypical district of approximately 3,900 students. In most instances, when prorated down for smaller districts, fewer staff are generated than are currently allocated through the Legislative Model. Districts also need non-personnel resources to maintain their districts offices and programs. *The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Central Office Personnel: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions. 1,000 ADM: 4.0 administrative and 4.0 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM. 3,500 ADM: 7.0 administrative and 9.0 classified positions.	Central Office Personnel: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions. 1,000 ADM: 4.0 administrative and 4.0 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM. 3,500 ADM: 8.0 administrative and 10.0 classified positions.	Central Office Personnel: 500 or fewer ADM: 3.0 administrative and 3.0 classified positions. 1,000 ADM: 4.0 administrative and 6.5 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM. 2,000 ADM: 5.5 administrative and 9.0 classified positions.	Administrative Personnel: -15.73 FTEs, ($2,383,253) Classified Personnel: 92.42 FTEs, $5,489,732 Net Total: 76.69 FTEs, $3,106,478

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Position counts prorated down linearly between 3,500 to 1,000 ADM. Position counts prorated up linearly above 3,500 ADM.	Position counts prorated down linearly between 3,500 to 1,000 ADM. Position counts prorated up linearly above 3,500 ADM.	Position counts prorated down linearly between 2,000 to 1,000 ADM. 4,000 ADM: 8.0 administrative and 16.0 classified positions. Position counts prorated down linearly between 4,000 to 2,000 ADM. 12,000 ADM: 24.0 administrative and 39.0 classified positions. Position counts prorated down linearly from 12,000 to 4,000 ADM. Position counts prorated up linearly above 12,000 ADM.	$0
<u>Non-Personnel Resources</u>: Provide an amount equal to $350.28 per ADM for non-personnel resources, inflated annually to $381.41.	<u>Non-Personnel Resources</u>: Provide an amount equal to $363.25 per ADM for non-personnel resources.	<u>Non-Personnel Resources</u>: Provide an amount equal to $363.25 per ADM for non-personnel resources.	

Analysis and Evidence

The 2010 EB Model recommendation and the Legislative Model rely on staff allocations for the central office based on district enrollment. In both the 2010 EB Model recommendation and Legislative Model, districts with 500 or fewer ADM receive three administrative and three classified positions for the central office. Between 501 and 1,000 ADM four administrative and four classified positions are funded with actual resources prorated upward as enrollment grows from 500 to 1,000 ADM. Beyond 1,000 ADM the 2010 EB Model recommendation and Legislative Model diverge, with the Legislative Model providing one additional administrative position for every 625 ADM and one classified position for every 417 ADM. The 2010 EB Model recommendation provides additional administrator positions for every 833 ADM and one additional classified position for every 500 ADM.

In our initial desk audit we provided a different staffing recommendation than the 2010 EB Model recommendation, but we were concerned this staffing level might be inappropriate in the Wyoming context and also decided it would be helpful to identify central office staffing positions at a range of school district sizes.

Resource Use Analysis

In SY 2013-14, the Legislative Model generated 279.7 central office administrative positions, while districts employed 36.3 more central office administrators for a total of 316.0. Twenty-nine districts employed more central office administrators than allocated, while 15 employed fewer, and two districts employed the same number. In addition, the districts employed 349.4 central office classified staff, 31.4 more than the 317.8 allocated through the Legislative Model. Four districts hired the same number of classified staff generated, while 20 employed more and 24 fewer.

Additional Analysis for the 2015 Recalibration

As previously mentioned, the 2015 recalibration of the central office element was conducted because we were concerned our staffing level outlined in the desk audit might be inappropriate in the Wyoming context and decided it would be helpful to identify central office staffing positions at a range of school district sizes. Our thought was if there were economies or dis-economies of scale, we could more clearly identify them with multiple “prototype” districts. Consequently, we engaged a team of consultants to help identify central office staffing recommendations. The three consultants with whom we worked are all former school superintendents and have nearly 100 years of school district administrative experience among them. The three are Mike Escalante, Dennis Smith and Kent Belcher. Brief biographies are included in Appendix A.

We investigated staffing recommendations for school districts with enrollments of 250, 500, 1,000, 2,000, 4,000 and 12,000 students. We then adjusted the staffing configurations to reflect the reality of Wyoming’s school funding system (100% reimbursement for special education and transportation, changes in our library staffing (librarians, library aides and school computer technicians) recommendations, no requirement for provision of Pre-K programs, and no intermediate education agencies such as county offices of education, or Education Service Districts).

We first describe the approach used to estimate central office resources. We then compare our revised 2015 EB Model recommendation to the 2010 EB Model recommendation using a 4,000 ADM student district staffing model. Finally, we then summarize the staffing configurations developed for Wyoming at alternative districts sizes.

Approach to Estimating Central Office Personnel Resources

In undertaking this analysis, we utilized the collective experience in school finance and budgets of the consultants assisting in recalibration of this element, leveraged their networks and relationships with numerous superintendents and chief business officials, reviewed district organizational studies and budgets, and analyzed district spending patterns to develop a set of templates for central office staffing.

Specifically, the following tasks were performed:

- Reviewed budgets and funding streams for districts of 250, 500, 1,000, 2,000, 4,000, and 12,000 students (they also considered districts of 25,000 and 50,000 students but those findings are not relevant in the Wyoming context);
- Scrutinized organizational charts, administrative regulations and school board policies to review staffing needs, patterns and formulas that determine state and district expenditures for central office staff;
- Interviewed superintendents and chief business officials to understand their thinking and rational for organizational staffing and district spending;

- Engaged in a two day conference to consider the staffing needs school districts require to successfully support the needs of a district's students at the district and school level; and
- Identified potential district office staffing templates for school districts that in their professional opinion adequately provide district offices with the necessary staff resources to provide support to their district school sites.

We made the following assumptions based on school district size:

<u>District of 250 students:</u>

- Little to no support services are provided by a county office of education or other intermediate education agency.
- Support services such as special education services including occupational therapy, physical therapy, legal services, facilities support, grounds maintenance and transportation, and food services etc. would be contracted out.
- Instructional services, human resources, curriculum and assessment, special education and professional development would be the responsibility of the superintendent.

<u>District of 500:</u>

- Little to no support services is provided by a county office of education or other intermediate education agency.
- Support services such as some special education services including occupational therapy, physical therapy, legal services, and facilities support, grounds, maintenance, and transportation and food services etc. would be contracted out. However the increase in student enrollment would necessitate the need for some special educational services being provided in house.
- Instructional services, human resources, curriculum and assessment, special education and professional development would be the primary responsibility of the superintendent.

<u>District of 1,000:</u>

- Little to no support services are provided by a county office of education or other intermediate education agency.
- Support services such as some special education services including occupational therapy, physical therapy, legal services, some facilities support, and transportation etc. would be contracted out. However the continued increase in student enrollment would necessitate the need for additional support service services being provided in house both administratively and with clerical support.

<u>District of 2,000:</u>

- Little to no support is provided by a county office of education.
- With the increase in enrollment the district now has the opportunity to provide district level resources and support in-house. This includes the sharing of responsibilities across divisions to provide the support schools and employees need. The individual school sites become increasingly autonomous and the superintendent provides both big picture and hands on leadership throughout the district.

<u>District of 4,000 or greater:</u>

- The size of the district now enables it to become a self-sufficient district that can operate on its own.

Central Office Staffing Recommendation

We explored staffing recommendations for all of the central office positions a school district would need. We modified the recommendations to reflect the way the Legislative Model operates. Specifically, we made the following adjustments:

- Eliminated special education staff recommendations because Wyoming currently reimburses school districts for 100% of approved special education expenditures;
- Eliminated transportation staff recommendations because the Wyoming currently reimburses school districts for 100% of approved transportation expenditures;
- Eliminated school computer technician positions under instructional technology and technology network and support as these positions are described and resourced at the school level;
- Eliminated the gifted and talented personnel positions in the central office because funding for gifted and talented children is resourced in Element 15; and
- Did not include position recommendations for Pre-K or early childhood education as it is currently not part of the educational basket of goods and services.[16]

To see how our revised EB recommendations compare to the 2010 EB recommendations, we compared a 4,000 student prototype district resource allocation in Table 3.21.

[16] If the Legislature decides to fund Pre-K programs, it may want to include funding for a central office position for districts of 4,000 or more students, prorated up and down to reflect actual district enrollment.

Table 3.21 Central Office Staffing Comparison between 2010 and 2015 EB Models

Office and Position	FTEs at 4,000 District ADM			
	2010 Evidence-Based Recommendation		2015 Evidence-Based Recommendation	
	Admin.	Classified	Admin.	Classified
Superintendent's Office				
Superintendent	1		1	
Secretary		1		2
Business Office				
Business Manager	1		1	
Director of Human Resources	1		1	
Accounting Clerk		1		2
Accounts Payable		1		2
Secretary		1		1
Curriculum and Support				
Assistant Superintendent for Instruction	1		1	
Director of Pupil Services	1		1	
Director of Assessment and Evaluation	1		1	
Secretary		3		3
Technology (Instructional and Network)				
Director of Technology	1		1	
Network Supervisor (hardware)		1		1
Systems Supervisor (software)		0.3		1
Computer Technician				
Secretary		1		2
Operations and Maintenance				
Director of O & M	1		1	
Secretary		1		2
Total Staff	**8**	**10.3**	**8**	**16**

Source: Authors' calculations.

Table 3.21 shows under both the 2010 EB Model and the 2015 EB Model, a total of 8 administrative positions would be provided for 4,000 ADM. This compares with the 9.1 central office administrators the Legislative Model allocates for a 4,000 ADM district. For classified staff, the 2010 EB Model allocates 10.3 positions, while the 2015 EB Model provides for 16 FTE positions. The Legislative Model allocates 11.4 classified positions at 4,000 students.

The major difference between the 2010 EB Model and the 2015 EB Model is the range of district sizes and various staffing levels at those sizes. Table 3.22 compares the 2015 EB Model central office positions with the number of central office positions that would be generated at the same district enrollments under the Legislative Model.

Table 3.22 2015 EB Model Recommendations Compared to Legislative Model

District ADM	Administrative Positions		Classified Positions	
	Legislative Model	2015 EB Recommendation	Legislative Model	2015 EB Recommendation
500	3.0	3.0	3.0	3.0
1,000	4.0	4.0	4.0	6.5
2,000	5.6	5.5	6.4	9.0
4,000	9.1	8.0	11.4	16.0
12,000	27.4	24.0	34.2	39.0

Source: Authors' calculations.

Our 2015 EB Model recommendation remains unchanged, districts with 500 or fewer ADM to be resourced three administrative and three classified positions. Position counts would be prorated linearly between each category. For example a district with 750 ADM would receive 3.5 administrative positions, and 4.75 classified positions. For districts above 500 ADM, position counts (and the funding for each) would be prorated between enrollment categories in the same way the Legislative Model adjusts between categories.

Central office Non-Personnel Costs

We also analyzed the non-personnel costs of a district central office, recognizing an issue with trying to identify a number like this is districts make vastly different decisions regarding staffing versus contracting for many services. As a result some districts may have fewer staff and higher contracting costs while other districts may have higher staffing costs and lower contracting costs. If those trade-offs are made, funds from one category can be used to support the other category. Our consultants viewed this per pupil figure as adequate. Consequently, the level of funding in the Legislative Model of $363.25 per ADM is adequate and is our recommendation for the 2015 EB Model, provided it is adjusted for inflation through an ECA as determined by the Legislature in the future.

2015 Evidence-Based recommendation:

<u>Central Office Personnel</u>:

- 500 or fewer ADM: 3.0 administrative and 3.0 classified positions;
- 1,000 ADM: 4.0 administrative and 6.5 classified positions. Position counts prorated down linearly between 1,000 to 501 ADM;
- 2,000 ADM: 5.5 administrative and 9.0 classified positions. Position counts prorated down linearly between 2,000 to 1,000 ADM;
- 4,000 ADM: 8.0 administrative and 16.0 classified positions. Position counts prorated down linearly between 4,000 to 2,000 ADM;
- 12,000 ADM: 24.0 administrative and 39.0 classified positions. Position counts prorated down linearly from 12,000 to 4,000 ADM; and
- Position counts prorated up linearly above 12,000 ADM.

<u>Non-Personnel Resources</u>: Provide an amount equal to $363.25 per ADM for non-personnel resources.

24. Transportation

Wyoming provides 100% reimbursement of approved (to and from school and approved student activities) transportation costs and we do not have any recommendation to change that policy.

25. Food Service Programs

Both the EB Model and the Legislative Model assume a school district's food service program is a self-supporting function. Consequently no additional resources are provided for food service programs in the EB Model. However, Wyoming school districts currently spend approximately $9.8 million more for school food services than they collect in meal charges and federal and state subsidies.[17]

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference
Assumed self-supporting.	Assumed self-supporting.	Assumed self-supporting but if Legislature seeks to subsidize food services it should be on a meal times rate basis	N/A

Additional Analysis for the 2015 Recalibration

At the September 2 and 3 meeting of the Select Committee on School Finance Recalibration, we presented a food services recommendation at the direction of the Select Committee. We maintain our previous position that school food services can be self-supporting, but also noted in smaller school districts with relatively low (compared to the national average) percentages of children eligible for free and reduced price lunches, there was a strong likelihood districts would have to subsidize their food service programs. We also noted most districts charged varying amounts for paid meals, and recommended that if the Legislature wanted to subsidize school food programs it should establish a categorical grant program to fund district food service programs on an amount based on the assumption paid meals were charged the federal subsidy amount.

Based upon conversations with food service program personnel at the WDE, we believe if the Legislature feels subsidies for food services are warranted, it should determine the overall level of subsidy it believes is needed and then provide the subsidy to all districts on a meals times rate basis, assuming the district meets established accounting standards for food service programs.

To estimate the potential categorical grant subsidy, we took the number of paid lunches (meals purchased by students not eligible for free and reduced price meals), estimated what the full federal subsidy would be for those meals if the students were eligible for free meals, and then compared that to what each district received for a paid meal including federal funding subsidies, federal food commodity effective subsidy (the value of federally provided food per meal) and the price paid for each paid meal. We then subtracted the difference from the data showing the district provided subsidy and the remaining balance, if any, represented the amount of the proposed categorical grant.

[17] Although food services are not funded in the EB or Legislative Models, in order to receive federal nutrition funding, the State must appropriate just under $500,000 a year to the program.

Determining Meal Prices

The first step in estimating the potential categorical grant subsidy is to determine what a subsidized meal's value is. Table 3.23 displays the figures we used for federal subsidies for lunch and breakfast for free meals, reduced price meals and paid meals for SY 2014-15. The subsidy for lunch includes six cents per meal for meeting federal nutrition guidelines. We did not include the severe need meal subsidies because no districts received them for lunch in SY 2014-15. Although some districts received severe need meal subsidies for breakfast, what we are interested in is the paid meals and comparison between income per meal using the districts' paid meal prices, and the amount the districts receive for subsidized meals.

Table 3.23 Federal Reimbursements per Meal Type

Meal Type	Free	Reduced Price	Paid
Lunch*	$3.04	$2.64	$0.34
Breakfast	$1.62	$1.32	$0.28

* Includes six cents per lunch for meeting nutritional guidelines
Source: WDE.

In addition to the subsidies displayed in Table 3.23, there is a United States Department of Agriculture food entitlement each district receives in the form of food from the federal government. In SY 2014-15, this subsidy amounted to $0.2375 per meal. In effect, for a paid lunch, total federal reimbursement equals $0.5775 ($0.34 cash and $0.2375 food equivalent) and for a paid breakfast it equals $0.5175.

Our comparison for each district can be estimated as:

(number of paid meals) x (total federal subsidy [$0.5775]) x (price charged for paid meals [district specific]) = district revenue for paid meals

The figure to which we would compare this is the revenue from the number of paid meals at the federal subsidy rates for free meals. We compute this for breakfasts and lunches separately, then sum the total and compare the district general fund subsidy to the amount of revenue they would receive when the $.5775 per meal is combined with the revenue they would generate from the number of paid meals times the price charged.

Table 3.24 displays the prices each school district charged in SY 2014-15 for paid school lunches and Table 3.25 displays the prices each district charged in SY 2014-15 for paid breakfasts.

Table 3.26 provides a summary of our computations for the potential categorical grant, which shows the estimated cost of our proposal would be slightly more than $5 million for SY 2014-15. The second and third columns of display the number of paid lunches and breakfasts served by each school district under the National School Lunch Program. The fourth column in Table 3.26 displays the amount of additional revenue a school district would have received (beyond the prices it charges and the federal paid meal subsidy of $0.5775 per lunch and $0.5175 for breakfast) if it charged enough to receive $3.04 for paid lunches and $1.62 for paid breakfasts, minus the price they charge and federal subsidies they receive for those meals. If this option was used, and the Legislature was to appropriate funds on a per meal basis, this would amount to approximately $0.47 for each of 11 million meals served each year. The level of the subsidy could be adjusted up or down by the Legislature, with resultant changes in the subsidy per paid meal.

There are additional issues or caveats to consider related to food service programs:

Price of Meals and Number of Paid Meals

There are many factors that impact the price districts charge for meals, and little data on the elasticity of demand for school meals (the impact an increase in price has on the number of meals purchased). This analysis has assumed the number of paid meals remains the same if the price were increased. This is unlikely to be the case, which means our estimate of the revenue a district would receive if it charged the same price as the subsidy is probably too high. There were no studies we could identify that specifically estimate these elasticities so it is impossible to estimate the exact impact.

Local Control

Based upon school district testimony, school districts make a number of choices as to how to prepare food, what types of food to purchase (organic, fresh, etc.) and also decide what price to charge. While such local control is an important Wyoming characteristic, establishment of state funding for any expenses beyond federal subsidies and locally charged prices creates a number of disincentives for school districts to search for market prices for meals or to operate efficiently. Hence our suggestion a categorical grant should be based on the costs above what the district would receive if it charged the total federal subsidy for paid meals.

Alternative Pricing

Three of the school districts in Fremont County do not have a price for paid meals; consequently they generate zero categorical grant assistance in our scenario, although each of them makes a contribution to food services from their general fund. Park County School District #16 does not appear to participate in the National School Lunch Program, and thus does not generate categorical funding in this scenario and data on the number of meals served and how they are paid for were not available from WDE.

Grade Level Lunch Participation

Although many school districts charge different prices for meals to students in elementary, middle and high schools, the WDE did not have data on the number of paid meals served by school level. Consequently, our revenue estimates for the revenue schools generated for paid meals assumed an equal number of students per grade and distributed the price to lunches proportionally (i.e. 6/13 of the meals were paid for at the elementary rate, 3/13 at the middle school rate and 4/13 at the high school rate.

No Standardized Accounting System for Food Services

The WDE indicated there is not a standardized accounting system for school food service programs among Wyoming school districts which causes the measurement of total costs to differ across districts. For example, not all districts include indirect costs or the costs of custodial services for food service areas in the food services budget, further reducing the reliability of the data used to make our estimates for this memo.

Reporting General Fund Subsidies

The data we received from the WDE were missing General Fund subsidies from seven school districts. If those data were available (and all reported subsidies for 2013-14), the total food service program contribution of school districts would increase, with a resultant increase in the predicted categorical fund amount.

Table 3.24 School Lunch Prices by District: SY 2014-15

District	Elementary	Middle	High School	District	Elementary	Middle	High School
Albany #1	$2.55	$2.80	$2.80	Lincoln #1	$3.30	$3.35	
Big Horn #1	$2.35	$2.65	$2.65	Lincoln #2	$2.25	$2.35	$2.50
Big Horn #2	$2.15	$2.45	$2.45	Natrona #1	$2.50	$2.75	$2.75
Big Horn #3	$2.50	$2.75	$2.75	Niobrara #1	$2.50	$2.50	$3.00
Big Horn #4	$2.10	$2.40	$2.40	Park #1	$2.60	$2.85	$2.85
Campbell #1	$2.50	$3.00	$3.00	Park #6	$2.50	$2.75	$2.75
Carbon #1	$2.25	$2.50	$2.50	Park #16	Does not participate in the NSLP		
Carbon #2	$2.75	$3.00	$3.00	Platte #1	$2.70	$2.70	$2.70
Converse #1	$2.65	$2.95	$2.95	Platte #2	$2.25	$2.50	$2.50
Converse #2	$2.25	$2.50	$2.50	Sheridan #1	$2.50		
Crook #1	$2.20	$2.30	$2.30	Sheridan #2	$2.50	$2.75	$3.00
Fremont #1	$2.25	$2.50	$2.50	Sheridan #3	$2.00	$2.35	$2.35
Fremont #2	$2.25	$2.50	$2.75	Sublette #1	$2.55	$2.80	$2.80
Fremont #6	$2.25	$2.50	$2.50	Sublette #9	$2.15	$2.50	$2.50
Fremont #14	Non-Pricing Program			Sweetwater #1	$2.85	$3.50	$3.50
Fremont #21	Non-Pricing Program			Sweetwater #2	$2.50	$2.75	$3.00
Fremont #24	$2.25	$2.55	$2.55	Teton #1	$2.50	$2.75	$3.00
Fremont #25	$1.90	$2.15	$2.15	Uinta #1	$2.30	$2.60	$2.90
Fremont #38	Non-Pricing Program			Uinta #4	$2.00	$2.25	$2.25
Goshen #1	$2.25	$2.45	$2.60	Uinta #6	$2.00	$2.25	$2.50
Hot Springs #1	$2.25	$2.55	$2.55	Washakie #1	$2.90	$3.15	$3.75
Johnson #1	$2.75	$3.00	$3.25	Washakie #2	$2.00	$2.50	$2.50
Laramie #1	$2.40	$2.60	$2.60	Weston #1	$2.50	$3.00	$3.00
Laramie #2	$2.50	$2.75	$2.75	Weston #7	$2.50	$2.80	$2.80

Source: WDE

Table 3.25 School Breakfast Prices by District: SY 2014-15

District	Elementary	Middle	High School	District	Elementary	Middle	High School
Albany #1	$1.40	$1.90	$1.90	Lincoln #1	$1.75	$1.90	
Big Horn #1	$1.50	$1.70	$1.70	Lincoln #2	$1.25	$1.50	$1.50
Big Horn #2	$1.35	$1.50	$1.50	Natrona #1	$1.50	$1.75	$1.75
Big Horn #3	$1.65	$1.75	$1.75	Niobrara #1			
Big Horn #4	$1.35	$1.35	$1.35	Park #1	$1.35	$1.60	$1.60
Campbell #1	$1.25	$1.50	$1.50	Park #6	$1.50	$1.75	$1.75
Carbon #1	$1.25	$1.75	$1.75	Park #16	Does not participate in the NSLP		
Carbon #2	$1.75	$1.75	$1.75	Platte #1			
Converse #1	$1.45	$1.50	$1.50	Platte #2	$1.00	$1.25	$1.25
Converse #2	$1.25	$1.40	$1.40	Sheridan #1	$0.50		
Crook #1	$1.35	$1.35	$1.35	Sheridan #2	$1.00	$1.25	
Fremont #1	$1.25	$1.25	$1.25	Sheridan #3			
Fremont #2	$1.25	$1.50	$1.75	Sublette #1	$1.50	$1.75	$1.75
Fremont #6	$1.00	$1.00	$1.00	Sublette #9	$1.50	$1.50	
Fremont #14	Non-Pricing Program			Sweetwater #1	$1.55	$2.15	$2.15
Fremont #21	Non-Pricing Program			Sweetwater #2	$1.75	$2.00	$2.25
Fremont #24				Teton #1	$1.30	$1.75	$1.75
Fremont #25	$1.25	$1.35	$1.35	Uinta #1	$1.50	$1.50	$1.50
Fremont #38	Non-Pricing Program			Uinta #4	$1.25		
Goshen #1	$1.50	$1.50	$1.50	Uinta #6			
Hot Springs #1	$1.75	$1.75	$1.75	Washakie #1	$2.20	$2.45	$3.00
Johnson #1	$1.50	$1.50	$1.50	Washakie #2			
Laramie #1	$1.25	$1.50	$1.50	Weston #1	$2.00	$2.25	$2.25
Laramie #2	$1.85	$1.85	$1.85	Weston #7	$2.00	$2.00	$2.00

Source: WDE

Table 3.26 Estimated Food Service Program Categorical Grant by School District, SY 2014-15

School District	Number of Paid Lunches	Number of Paid Breakfasts	Total Revenue At Free Meal Subsidy Rate Minus Estimated Actual Revenue	General Fund Contribution	Predicted Maximum Categorical Grant
Albany #1	165,047	17,120	$162,750.69	$245,511.00	$82,760.31
Big Horn #1	38,334	0	$42,064.13	$125,000.00	$82,935.87
Big Horn #2	40,552	0	$50,867.36	$102,100.00	$51,232.64
Big Horn #3	21,493	0	$21,400.01	$120,000.00	$98,599.99
Big Horn #4	15,451	0	$19,987.36	$60,000.00	$40,012.64
Campbell #1	477,692	33,545	$455,076.83	$820,000.00	$364,923.17
Carbon #1	77,593	3,107	$93,732.17	$350,000.00	$256,267.83
Carbon #2	34,591	1,405	$28,078.76	$0.00	$0.00
Converse #1	106,304	14,123	$98,694.15	$206,400.00	$107,705.85
Converse #2	37,206	4,787	$47,203.07	$150,000.00	$102,796.93
Crook #1	53,044	1,865	$69,018.48	$285,000.00	$215,981.52
Fremont #1	56,890	0	$67,815.04	$304,910.00	$237,094.96
Fremont #2	10,770	1,863	$13,436.68	$127,131.00	$113,694.32
Fremont #6	19,501	0	$23,245.21	$100,000.00	$76,754.79
Fremont #14	23,278	0	No pricing program	$450,000.00	$0.00
Fremont #21	18,185	0	No pricing program	$420,000.00	$0.00
Fremont #24	28,958		$34,049.68	$125,000.00	$90,950.32
Fremont #25	99,715	0	$146,273.14	$245,000.00	$98,726.86
Fremont #38	0	0	No pricing program	$225,000.00	$0.00
Goshen #1	60,752	0	$72,554.62	$200,000.00	$127,445.38
Hot Springs #1	35,166	0	$41,349.47	$99,000.00	$57,650.53
Johnson #1	61,854	1,060	$48,528.17	$0.00	$0.00
Laramie #1	529,725	16,179	$586,364.17	$1,400,000.00	$813,635.83
Laramie #2	45,406	0	$45,210.77	$0.00	$0.00
Lincoln #1	20,577	3,299	$18,120.44	$83,000.00	$64,879.56
Lincoln #2	132,990	2,071	$164,251.34	$0.00	$0.00
Natrona #1	503,728	14,942	$506,826.39	$1,269,000.00	$762,173.61
Niobrara #1	11,035		$11,366.73	$35,000.00	$23,633.27
Park #1	100,233	2,646	$93,160.32	$0.00	$0.00
Park #6	58,862	0	$58,609.24	$0.00	$0.00
Park #16			$0.00	$0.00	$0.00
Platte #1	48,687	0	$44,771.78	$215,000.00	$170,228.22
Platte #2	11,684	0	$13,926.90	$55,000.00	$41,073.10
Sheridan #1	22,114	840	$42,320.30	$209,787.00	$167,466.70
Sheridan #2	140,981	0	$137,098.51	$110,000.00	$0.00
Sheridan #3	6,543		$8,871.28	$75,000.00	$66,128.72

School District	Number of Paid Lunches	Number of Paid Breakfasts	Total Revenue At Free Meal Subsidy Rate Minus Estimated Actual Revenue	General Fund Contribution	Predicted Maximum Categorical Grant
Sublette #1	78,690	8,783	$89,491.04	$100,000.00	$10,508.96
Sublette #9	41,003	2,211	$51,546.60	$255,000.00	$203,453.40
Sweetwater #1	174,648	4,027	$107,272.73	$0.00	$0.00
Sweetwater #2	136,661	3,318	$133,284.18	$225,000.00	$91,715.82
Teton #1	149,107	11,102	$145,892.69	$127,908.00	$0.00
Uinta #1	146,143	0	$162,026.79	$408,555.00	$246,528.21
Uinta #4	62,883	4,049	$89,299.55	$90,000.00	$700.45
Uinta #6	39,141		$53,431.62	$112,000.00	$58,568.38
Washakie #1	64,466	0	$40,340.32	$150,690.00	$110,349.68
Washakie #2	8,278		$10,821.91	$60,000.00	$49,178.09
Weston #1	48,481	3,562	$44,261.87	$55,000.00	$10,738.13
Weston #7	19,934	3,099	$19,886.90	$70,000.00	$50,113.10
Total				**$9,865,992.00**	**$5,146,607.14**

Source: WDE and Authors' calculations.

2015 Evidence-Based recommendation: Our recommendation remains the same as in previous years that food services programs should be self-supporting. If, however, the Legislature believes school district food services programs should be subsidized, it should implement a subsidy for food services based on a rate times meals approach.

RESOURCES FOR STRUGGLING STUDENTS

The staffing for core programs section contains positions for supporting teachers and students beyond the regular classroom teacher. Those positions include: elective or specialist teachers, core tutors, instructional facilitators, substitute teachers, core guidance counselors, nurses, supervisory aides, librarians, library aides, school computer technicians, school administrators and school secretarial and clerical staff.

In many instances, additional support for struggling students is needed. The programs described in this section extend the learning time for struggling students in focused ways. The key concept is to implement the maxim of standards-based education reform: keep standards high for all students but vary the instructional time so all students can achieve to proficiency levels. The EB Model elements for extra help are also embedded in the RTI schema described at the beginning of this chapter.

It is important to note the Legislative Model uses two specific counts of pupils to define struggling students to generate these resources. For consistency purposes, we use these same counts for the EB Model to compare resources between the two Models. Wyoming Statute and WDE rules and regulations provide the specifics on how these counts are generated, but in general they are defined as:

1. At-risk count: defined as the unduplicated count of students eligible for free and reduced price lunch, ELL students and mobile students in grades 6-12.

2. ELL count: The number of students defined as ELL.

The EB Model provides substantial additional resources for struggling students: tutors, ELL teachers, pupil support, and summer school and extended day programs. These resources for students struggling should be viewed in concert with resources for students with identified disabilities. Districts sometimes over identify students for special education services as the “only” way to trigger more resources for some struggling students. The EB Model goal in expanding resources for struggling students is to provide adequate resources for all struggling students, with or without a diagnosed disability, and to reduce over identification in special education.

This section includes discussion of seven categories of services: at-risk tutors, at-risk pupil support, extended day programs, summer school programs, ELL teachers, alternative schools and special education.

26. At-Risk Tutors

The first strategy to help struggling students is to provide additional support for struggling students as described in Element 8 above. In addition to the one core tutor position provided to every prototypical school discussed above for Element 8, the EB Model provides additional tutor position at the rate of one for every 125 at-risk students.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 1.0 tutor position for every 100 at-risk students. Not provided for small or alternative schools.	Provide 1.0 tutor position for every 100 at-risk students. Not provided for small or alternative schools.	Provide 1.0 tutor position for every 125 at-risk students.	-63.36 At-Risk Tutor FTEs, ($4,913,146) *Note: Net increase in total tutors of 225.28 FTEs, $17,476,819 when accounting for both Core (Element 8) and At-Risk tutors (Element 26).*

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Refer to Element 8 for an explanation of analysis and evidence surrounding the use of tutors.

Resource Use Analysis

Refer to Element 8 for an explanation of the resources use analysis surrounding the use of tutors.

Additional Analysis for the 2015 Recalibration

Over the past few years, the EB Model recommendation has changed to include one core tutoring position in each prototypical school based upon a school's ADM and irrespective of the number of at-risk students. Additional tutoring resources are then generated based upon a school's at-risk count at the rate of one additional tutoring position for every 125 at-risk students, with no minimums. The effect of this change in the EB Model is to increase the number of tutors at a school. Under the Legislative Model, a school with 125 at-risk students receives 1.25 tutors positions, whereas under the 2015 EB Model recommendation that school would receive the core tutor based on the school ADM, *plus* an additional 0.8 at-risk tutor position due to the 125 at risk students. The difference is that under the Legislative Model, the minimum tutor positions are part of the FTE generated by the at-risk student count, whereas under our 2015 EB Model recommendation, the core tutor position is in addition to the resources generated through the at-risk count. Additionally, the at-risk formula has been changed from one at-risk tutor position per 100 at-risk students to one at-risk tutor position per 125 at-risk students. A similar change is made in the 2015 EB Model recommendations for at-risk pupil support, Element 27.

These two new, linked recommendations provide an estimated increase in total tutors of 219 FTEs at an additional cost of $17,024,174 when accounting for both core (Element 8) and at-risk tutors (Element 26).

During 2015 recalibration process, questions were asked regarding the use of instructional aides rather than certified tutors. Based upon the WDE's analysis, we know school districts employed 223 fewer certified tutors than the Legislative Model provided in SY 2013-14. The Legislative Model provided 387 tutoring positions and school districts employed 163. School districts tend to use instructional aides for tutoring rather than certified teacher tutors. The WDE's data shows school districts employ 197 more aides than the Legislative Model provides.

To provide more background on these instructional aides, in early summer 2015 the WDE surveyed school districts on their use of instructional aides. Five questions were asked regarding the use of instructional aides:

1. What is the number (FTE) of non-special education instructional aides employed at your district who are funded from general fund dollars?
2. How many instructional aides at your district have gone through intensive tutor training or professional development?
3. What professional development programs or qualification requirements are utilized?
4. Please provide additional information on instructional aide requirements.
5. Additional comments related to instructional aides.

Though only 38 of 48 school districts responded to the survey, there are several key findings that give insight into the use of instructional aides. First, districts reported hiring approximately 570 non-special education aides from general fund resources for SY 2014-15. Second, districts reported use of a wide variety of approaches to selecting instructional aides and determining whether they were "highly qualified" or certified. The most common strategies used included the ETS Para Pro Certification system, a requirement the aide have two years of study at a community or other college, and/or the aide meets a standard of quality established by the district that included assessment of math, reading and writing. Third, school districts reported 671 instructional aides were trained in a tutoring program or related professional development. These numbers suggest districts use instructional aides extensively and report that they train them in tutoring skills or tutoring programs.

These findings suggest districts have a strong preference for use of instructional aides to providing tutoring and/or Tier 2 intervention help to struggling students. The EB Model perspective is certified, skilled teacher tutors have the largest impact in boosting the learning of struggling students; indeed, the research shows certified teachers have twice the impact of selected, trained and supervised instructional aides. The EB Model perspective also is certified teachers should be used to provide extra help to struggling students that are in the lower portions of the achievement distribution, around the bottom third, but trained and supervised aides can be used for students with less complex learning needs. The survey did not seek to determine the degree to which this principle was followed; perhaps subsequent surveys can seek more specific answers to the question of which struggling students are served by certified teachers and which by instructional aides. Right now the service strategies are heavily biased towards instructional aides, although the EB Model would support a greater reliance on certified teachers.

Moreover, at the July 1-2, 2015 Stakeholder meetings, several representatives from schools and districts stated they use the resources provided for tutoring or Tier 2 intervention in a variety of ways, including using certified tutors and trained instructional aides to provide extra help in one-to-one or small group settings, i.e., up to five or six students. They also reported using paraprofessionals to gather student performance data. This led to two concerns. The first is use of paraprofessionals to provide these services and the second is the way they are reported to the WDE.

Several districts hired certified teachers into paraprofessional positions, so the extra help was being provided by fully trained teachers even though such individuals were hired into and reported as a paraprofessional position. Other districts claimed they hired “highly qualified” paraprofessionals and had provided substantial training for them.

To provide these services, representatives of a number of elementary schools and some secondary schools scheduled a daily “intervention” time block of at least 30 minutes during which students would either receive extra help or engage in enrichment activities. Stakeholders from several middle and high schools indicated their staff encourages students who are struggling in academic courses like Algebra 1 or reading to take a double period so they can receive extra help in that subject during the second period.

A “problem” that emerged was these specially selected and trained paraprofessionals could not be reported as tutors in the “teacher tutor” reporting category to the WDE. However, the CREWR report excludes the trained paraprofessionals in the tutor count and includes them in the supervisory aide count. The WDE should modify the CRERW report to include a reporting of instructional aides who are providing Tier 2 intervention assistance. The State might also want to conduct a random “audit” of the use of paraprofessional staff for tutoring to insure that these staff are specially selected, trained and supervised as part of a tutoring program.

2015 Evidence-Based recommendation: Provide one at-risk tutor position for every 125 at-risk students.

27. Pupil Support

Core pupil support positions for guidance counselors and nurses are discussed in Element 10. At-risk students, however, generally have more non-academic needs that should be addressed by additional pupil support staff, which include additional guidance counselors, as well as social workers, family liaison staff, and psychologists. Thus, in addition to the core guidance counselor and nurse positions, the EB Model provides additional pupil support positions at the rate of one position for every 125 at-risk students.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 1.0 at-risk pupil support position for every 100 at-risk students. Not provided for small or alternative.	Provide 1.0 at-risk pupil support position for every 100 at-risk students. Not provided for small or alternative.	Provide 1.0 at-risk pupil support position for every 125 at-risk students.	-63.36 FTEs, ($4,913,146) *Note: Net decrease in total pupil support of 84.37 FTEs, $6,540,549 when accounting for both Core (Element 10) and At-Risk pupil support (Element 27).*

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

At-risk students tend to have more non-academic issues for schools to address. This usually requires interactions with families and parents as well as perhaps more guidance counseling in school. The EB Model addresses this by providing more pupil support staffing resources to meet these needs. Although there are many ways schools can provide outreach to parents, or involve parents in school activities – from fund raisers to governance – research shows school sponsored programs that have an impact on achievement address what parents can do at home to help their children learn. For example, if the education system has clear content and performance standards, programs that help parents and students understand both what needs to be learned and what constitutes acceptable standards for academic performance have been found to improve student outcomes. Parent outreach that explicitly and directly addresses what parents can do to help their children be successful in school, and to understand the standards of performance that the school expects, are the types of school-sponsored parent activities that produce discernible impacts on students' academic learning (Steinberg, 1997).

At the secondary level, the goal of parent outreach programs is to have parents learn about what they should expect of their children in terms of academic performance. If a district or a state requires a minimum number of courses for graduation, such as Wyoming's high school graduation and Hathaway scholarship requirements, those requirements should be made clear. Any differences between the two also should be addressed. If either average scores on end-of-course examinations or a cut-score on a comprehensive high school test are required for graduation, they too should be discussed. Secondary schools need to help parents understand how to more effectively assist their children in identifying an academic pathway through middle and high school, understand standards for acceptable performance, and be aware of the course work necessary for college entrance. This is particularly important for parents of students in the middle or lower end of the achievement range, as often these students know very little of the requirements for transition from high school to postsecondary education (Kirst & Venezia, 2004).

At the elementary level, the focus for parent outreach and involvement programs should concentrate on what parents can do at home to help their children learn academic work for school. Too often parent programs focus on fund raising through parent-teacher organizations, involvement in decision making through school site councils, or other non-academically focused activities at the school site. Although these school-sponsored parent activities might impact other goals – such as making parents feel more comfortable being at school or involving parents more in some school policies – they have little effect on student academic achievement. Parent actions that impact learning would include: 1) reading to them at young ages, 2) discussing stories and their meanings, 3) engaging in open ended conversations, 4) setting aside a place where homework can be done, and 5) ensuring that their child completes homework assignments.

The resources in the EB and Legislative Models are adequate to create and deploy the ambitious and comprehensive parent involvement and outreach programs that are part of two comprehensive school designs: Success for All Program and the Comer School Development Program. The Success for All Program includes a family outreach coordinator, a nurse, a social worker, a guidance counselor and an education diagnostician for a school of about 500 students. This group functions as a parent outreach team for the school, serves as case managers for students who need non-academic and social services, and usually includes a clothing strategy to ensure all students, especially in cold climates, have sufficient and adequate clothes, and coats, to attend school.

The Comer School Development Program was created on the premise of connecting schools more to their communities. Its Parent-School team has a somewhat different composition and is focused on training parents to raise expectations for their children's learning, to work with social service agencies and to work with the school's faculty to raise their expectations for what students can learn. Sometimes the team co-locates on school site premises to provide a host of social services

A program called Communities in Schools, which now operates in 26 states and the District of Columbia and can be resourced by the resources provided by this element, has been successful in raising school attendance rates as students need to attend school in order to learn. The program adds a caseworker, often trained in social work, to a school's pupil support team to help match social services provided by non-educational agencies to students who need them.

Resource Use Analysis

Allocation of pupil support personnel in relation to model allocations is described Element 10.

2015 Evidence-Based recommendation: Provide one at-risk pupil support position for every 125 at-risk students.

28. Extended-Day Programs

At both elementary and secondary school levels, some struggling students are likely to benefit from after-school or extended-day programs, even if they receive tutoring or Tier 2 interventions during the regular school day.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.**	For both extended-day and summer school programs, funding is provided outside of block grant and as a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students. Not provided for small or alternative schools. A minimum 0.50 FTE is provided for school districts that do not generate that amount based upon the district's at-risk count.	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.**	241.98 FTEs, $18,777,847

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.
**This formula equates to one teacher position for every 30 at-risk students or 3.33 positions per 100 at-risk students and paid at the rate of 25% of a teacher's annual salary; enough to pay a teacher for a two hour extended-day program, five days per week.

Analysis and Evidence

Extended-day programs provide environments for children and adolescents to spend time after the school day ends during the regular school year. In a review of research, Vandell, Pierce and Dadisman (2005) found well designed and administered after-school programs yield numerous improvements in academic and behavioral outcomes (see also Fashola, 1998; Posner & Vandell, 1994). On the other hand, the evaluation of the 21st Century Community Learning Centers Program (James-Burdumy et al., 2005), though hotly debated, indicated for elementary students, extended-day programs did not appear to produce measurable academic improvement. Critics of this study (Vandell, Pierce & Dadisman, 2005) argued the control groups had higher pre-existing achievement, which reduced the potential for finding program impact. They also argued the small impacts identified had more to do with the lack of full program implementation during the initial years than with the strength of the program.

Overall, studies have documented positive effects of extended-day programs on the academic performance of students in select after-school programs (e.g., Takoata & Vandell, 2013: Vandell, 2014). However, the evidence is mixed both because of research methods (few randomized trials), poor program quality and imperfect implementation of the programs studied. Researchers have identified several structural and institutional supports necessary to make after-school programs effective:

- Staff qualifications and support (staff training in child or adolescent development, after-school programming, elementary or secondary education, and content areas offered in the program, staff expertise; staff stability/turnover; compensation; institutional supports).
- Program/group size and configuration (enrollment size, ages served, group size, age groupings and child staff ratio) and a program culture of mastery.
- Consistent participation in a structured program.

- Financial resources and budget (dedicated space and facilities that support skill development and mastery, equipment and materials to promote skill development and mastery; curricular resources in relevant content areas; location that is accessible to youth and families).
- Program partnerships and connections (with schools to connect administrators, teachers and programs; with larger networks of programs, with parents and community).
- Program sustainability strategies (institutional partners, networks, linkages; community linkages that support enhanced services; long term alliances to ensure long term funding).

The resources recommended in the EB Model could be used to provide struggling students in all elementary grades and in secondary schools with additional help during the school year but before or after the normal school day. Because not all at-risk students need or will attend an after -school program, the EB Model assumes 50% of the eligible at-risk students will attend the program – a need and participation figure identified by Kleiner, Nolin and Chapman (2004). Providing resources at a rate of one teacher position for every 30 at-risk students results in class sizes of approximately 15 students in extended-day programs. This position is paid at the rate of 25% of the annual salary, enough to pay a teacher for a two-hour extended-day program, five days a week. A more simple approach to funding this element is to resource one teacher position for every 120 at-risk students.

The State should monitor over time the degree to which the estimated 50% figure accurately estimates the numbers of students needing extended-day programs. We also encourage Wyoming to require districts to track the students participating in the programs, their pre- and post-program test scores, and the specific nature of the after-school program provided, to develop a knowledge base about which after-school program structures have the most impact on student learning. We recognize these extended-day services provided will vary across Wyoming's school districts, and any monitoring of the impacts of these resources should focus more on impacts on student performance than the strategy for providing the services. We also found most of the schools we studied in other states that improved student performance had various combinations of before- and after-school extra help programs.

Resource Use Analysis

The CRERW report does not report expenditures or position counts for extended-day programs, but we did receive some data from the WDE during the 2015 recalibration process which is discussed below.

Additional Analysis for the 2015 Recalibration

Districts receive funding for both extended-day and summer school programs through a categorical program called the Bridges Program. Funding is only provided to districts for actual costs incurred in providing these programs. According to information[18] provided by the WDE, since 2005, the number of students enrolled in extended-day programs and the resources provided have increased. Table 3.27 provides data on expenditures from the Bridges Program and other funds for SY 2005-06 through SY 2013-14.

[18] http://legisweb.state.wy.us/InterimCommittee/2015/SSRRpt0806Appendix17.pdf

Table 3.27 Extended-Day Expenditures and Enrollment in the Bridges Program

School Year	Bridges Grant	Other Funds*	Total Expenditures	Total Enrollment
2005-06	$839,233	$210,034	$1,049,267	3,498
2006-07	$2,302,920	$512,488	$2,815,408	5,735
2007-08	$2,265,284	$607,496	$2,872,780	5,476
2008-09	$367,431	$3,718,951	$4,086,382	4,988
2009-10	$3,086,448	$1,058,025	$4,144,473	7,536
2010-11	$3,592,966	$685,628	$4,278,594	8,339
2011-12	$4,022,537	$6,392,994	$10,415,531	9,880
2012-13	$4,034,491	$6,024,539	$10,059,030	9,470
2013-14	$4,232,229	$871,235	$5,103,464	11,868

*Some of these figures according to the WDE could not be verified.
Source: WDE report submitted July 10, 2015.

According to the WDE, in SY 2005-06, only 14 school districts used the Bridges Program for extended day programs. Each year the number of school districts providing extended day services has increased and in SY 2013-14 43 provided extended-day programs using the Bridges Program funding. However, the Bridges Program (including both summer school and extended-day) funding is between 30 and 33% of EB Model recommendations, and the extended-day and summer school programs funded by the Bridges Program serve near 12,000 students or about one-third of the total number of the 36,000 at-risk students across Wyoming.

The 2015 EB Model recommendation continues to provide full funding for extended-day programs at the rate of one teacher position for every 120 at-risk students. We also support retaining these resources as a categorical program to ensure all such resources are spent on students struggling to achieve to rigorous academic standards.

Program reports do not indicate how the dollars were used in either the extended-day or summer school programs. However, given the modest increase in student performance in Wyoming over the past ten years, it could be argued that more extra help for struggling students, such as those that can be provided in extended-day and summer school, is still needed to bring more students up to new, rigorous proficiency standards.

2015 Evidence-Based recommendation: Provide one extended-day teacher position for every 120 at-risk students.

29. Summer School Programs

Many students need extra instructional time to achieve the state's high proficiency standards. Thus, summer school programs should be part of the set of programs available to provide struggling students the additional time and help they need to achieve to standards and earn academic promotion from grade to grade (Borman, 2001). Providing additional time to help all students master the same content is an initiative that is grounded in research (National Education Commission on Time and Learning, 1994). It should be noted summer school services are provided outside of the regular school year.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.**	For both extended-day and summer school programs, funding is provided outside of block grant and as a categorical grant at an amount equal to a 0.15 teacher FTE for every 30 at-risk students. Not provided for small or alternative schools. A minimum 0.50 FTE is provided for school districts that do not generate that amount based upon the district's at-risk count.	Provide 1.0 teacher position for every 120 at-risk students. Provide resources outside the block grant as a categorical grant.**	203.79 FTEs, $15,815,521 (net minimum of 0.50 FTE provided by Legislative Model)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.
**This formula equates to one teacher position for every 30 at-risk students or 3.33 positions per 100 at-risk students and paid at the rate of 25% of a teacher's annual salary; enough to pay a teacher for a six hour summer program, five days per week for eight weeks.

Analysis and Evidence

Research dating back to 1906 shows students, on average, lose a little more than a month's worth of skill or knowledge over the summer break (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). Summer breaks have a larger deleterious impact on poor children's reading and mathematics achievement. This loss can reach as much as one-third of the learning during a regular nine-month school year (Cooper et al., 1996). A longitudinal study by Alexander and Entwisle (1996) showed these income-based summer learning differences accumulate over the elementary school years, such that poor children's achievement scores – without summer school – fall further and further behind the scores of middle class students as they progress through school grade by grade. As a result of this research, there is emerging consensus that what happens (or does not happen) during the summer can significantly impact the achievement of students from low-income and at-risk backgrounds, and help reduce (or increase) the poor and minority achievement gaps in the United States.

However, evidence on the effectiveness of summer programs in attaining either of these goals is mixed. Although past research linking student achievement to summer programs shows some promise, several studies suffer from methodological shortcomings and the low quality of the summer school programs themselves (Borman & Boulay, 2004).

A meta-analysis of 93 summer school programs (Cooper, Charlton, Valentine, & Muhlenbruck, 2000) found the average student in summer programs outperformed about 56% to 60% of similar students not receiving the programs. However, the certainty of these conclusions is compromised because only a small number of studies (e.g., Borman, Rachuba, Hewes, Boulay & Kaplan, 2001) used random assignment, and program quality varied substantially. More recent randomized controlled trial research of summer school reached more positive conclusions about how such programs can positively impact student learning (Borman & Dowling, 2006; Borman, Goetz & Dowling, 2009). Indeed, Roberts (2000) found an effect size of 0.42 in reading achievement for a randomized sample of 325 students who participated in the Voyager summer school program.

Researchers (see also McCombs, et al., 2011) note several program components related to improved achievement effects for summer program attendees, including:

- Early intervention during elementary school;
- A full 6-8 week summer program;
- A clear focus on mathematics and reading achievement, or failed courses for high school students;
- Small-group or individualized instruction;
- Parent involvement and participation;
- Careful scrutiny for treatment fidelity, including monitoring to ensure good instruction in reading and mathematics is being delivered; and
- Monitoring student attendance.

Summer programs that include these elements hold promise for improving the achievement of at-risk students and closing the achievement gap. Indeed, the most recent review of the effects of summer school programs reached this same conclusion (Kim & Quinn, 2013). Their meta-analysis of 41 school- and home-based summer school programs found students in kindergarten through grade 8 who attended summer school programs with teacher directed literacy lessons showed significant improvements in multiple areas including reading comprehension. Moreover, the effects were much larger for students from low-income backgrounds.

In sum, research generally suggests summer school is needed and can be effective for at-risk students. Studies suggest the effects of summer school are largest for elementary students when the programs emphasize reading and mathematics, and for high school students when programs focus on courses students failed during the school year. The more modest effects frequently found in middle school programs can be partially explained by the emphasis in many middle school summer school programs on adolescent development and self-efficacy, rather than academics.

Because summer school can produce powerful impacts, the EB Model provides resources for summer school for classes of 15 students, for 50% of all at-risk students in all grades K-12, an estimate of the number of students still struggling to meet academic requirements (Capizzano, Adelman & Stagner, 2002). The EB Model provides resources for a program of eight weeks in length and a six-hour day, which allows for four hours of instruction in core subjects. A six-hour day would also allow for two hours of non-academic activities. The formula would be one teacher position for every 30 at-risk students or 3.33 per 100 such students. This position is paid at the rate of 25% of the annual salary. Simplified, the formula equates to one teacher position for every 120 at-risk students.

Resource Use Analysis

The CRERW report does not report expenditures or position counts for extended-day programs, but we did receive some data from the WDE during the 2015 recalibration process that is discussed below.

Additional Analysis for the 2015 Recalibration

As mentioned in the extended-day program discussion, districts receive funding for summer school programs through a categorical program called the Bridges Program. Funding is only provided to districts for actual costs incurred in providing these programs. Since 2005, the number of students enrolled in summer school programs and the resources provided have increased. Table 3.28 provides data on expenditures from the Bridges Program and other funds for SY 2005-06 through SY 2013-14.

Table 3.28 Summer School Expenditures and Enrollment in the Bridges Program

School Year	Bridges Grant	Other Funds*	Total Expenditures	Total Enrollment
2005-06	$5,036,376	$1,165,620	$6,201,996	7,389
2006-07	$5,325,553	$868,586	$6,194,139	7,533
2007-08	$4,207,205	$582,302	$4,789,507	7,366
2008-09	$5,797,516	$1,078,849	$6,876,365	8,982
2009-10	$6,953,633	$2,073,204	$9,026,837	9,545
2010-11	$8,523,972	$2,657,238	$11,181,210	10,031
2011-12	$8,437,909	$2,066,512	$10,504,421	9,855
2012-13	$9,076,598	$2,987,540	$12,064,138	10,827
2013-14	$9,697,438	$2,379,478	$12,076,916	12,344

*Some of these figures according to the WDE could not be verified.
Source: WDE report submitted July 10, 2015.

According to the WDE, in SY 2005-06, 40 school districts used the Bridges Program for summer school programs. All school districts provided summer school services in SY 2013-14 using the Bridges Program funding. However, the Bridges Program (including both summer school and extended-day) funding is between 30 and 33% of EB Model recommendations, and the extended-day and summer school programs funded by the Bridges Program serve near 12,000 students or about one-third of the total number of the 36,000 at-risk students across Wyoming.

The 2015 EB Model recommendation continues to provide full funding for summer school programs at the rate of one teacher position for every 120 at-risk students. We also support retaining these resources as a categorical program to ensure all such resources are spent on students struggling to achieve to rigorous academic standards.

2015 Evidence-Based recommendation: Provide one summer school teacher position for every 120 at-risk students.

30. English Language Learner (ELL) Students

Research, best practices and experience show that ELL students need assistance to learn English, in addition to instruction in the regular content classes. This can include some combination of small classes, English as a second language classes, professional development for teachers to help them teach “sheltered English classes, and “reception” centers for districts with large numbers of ELL students who arrive as new immigrants to the country and the school throughout the year.

The EB Model provides ELL teachers separately from the at-risk resources for tutors, pupil support, extended-day and summer school for all ELL students using the ELL count.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Provide 1.0 ELL teacher position for every 100 ELL students. Not provided for small or alternative schools.	Provide 1.0 ELL teacher position for every 100 ELL students. Not provided for small or alternative schools.	Provide 1.0 ELL teacher position for every 100 ELL students.	0.39 FTEs, ($30,451)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

Good ELL programs work, whether the approach is structured English immersion (Clark, 2009) or initial instruction in the native language, often called bilingual education. However, bilingual education is difficult to provide in most schools because students come from so many different language backgrounds. Nevertheless, bilingual programs have been studied intensively. A best-evidence synthesis of 17 studies of bilingual education (Slavin & Cheung, 2005) found ELL students in bilingual programs outperformed their non-bilingual program peers. Using studies focused primarily on reading achievement, the authors found an effect size of +0.45 for ELL students. A more recent randomized controlled trial also produced strong positive effects for bilingual education programs (Slavin, et al., 2011), but concluded the language of instruction is less important than the approaches taken to teach reading.

Addressing that important issue in *The Elementary School Journal,* Gerstein (2006) concludes ELL students can be taught to read in English if, as shown for monolingual students, the instruction covers phonemic awareness, decoding, fluency, vocabulary and reading comprehension. Gerstein's studies also showed ELL students benefit from instructional interventions initially designed for monolingual English speaking students, the resources for which are included in the four at-risk student triggered programs: tutoring, extended-day, summer school and pupil support.

Beyond the provision of additional teachers to provide English as a second language instruction to students, however, research shows ELL students need a solid and rigorous core curriculum as the basis from which to provide any extra services (Gandara & Rumberger, 2008; Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003). This research suggests ELL students need:

- Effective teachers – a core goal of all the staffing in the EB Model.
- Adequate instructional materials and good school conditions.
- Good assessments of ELL students so teachers know in detail their English language reading and other academic skills.
- Less segregation of ELL students
- Rigorous and effective curriculum and courses for all ELL students, including college and career ready, and affirmative counseling of such students to take those courses.
- Professional development for all teachers, focusing on sheltered English teaching skills.

Hakuta (2011) supports these conclusions and notes that English language learning takes time and that "academic language" is critical to learning the new CCSS. The new standards require more explicit and coherent ELL instructional strategies and extra help services if these are to be effective at ensuring ELL students learn the subject matter, English generally, and academic English specifically – learn how to read content texts in English. Most also would agree if this instruction requires smaller regular classes, those are already provided by the Legislative Model.

Additional teaching staff are needed to provide English as a second language instruction during the regular school day, such as having ELL students take English as a second language course in lieu of an elective course. Although the potential to eliminate some elective classes exists if there are large numbers of ELL students who need to be pulled out of individual classrooms, it is generally agreed that to fully staff a strong ELL program, each 100 ELL students should trigger one additional teaching position. This makes it possible to provide additional instructional opportunities for ELL students to provide an additional dose of English instruction. The goal of this programming is to reinforce ELL student learning of academic content and English so at some point the students can continue their schooling in English only.

Research shows ELL students from lower income and generally less educated backgrounds struggle most in school and need extra help to learn both academics and English. The EB and Legislative Models address this need by ensuring the ELL resources triggered by ELL counts are in addition to other Tier 2 intervention resources including tutoring, pupil support, extended-day and summer school by providing one teacher position for every 100 ELL students. Given these realities, it is more appropriate to view the EB Model and Legislative Model approach to extra resources for ELL students as including both resources for students from at-risk counts and ELL count specific resources.

Resource Use Analysis

The CRERW report does not indicate how districts use ELL funds, but does note the ELL population in Wyoming has decreased to 3% of student enrollment in SY 2014-15 compared to 3.6% in SY 2006-07. The WDE provided information[19] to the Select Committee on School Finance Recalibration on the number of ELL related staff school districts employed. Table 3.29 provides a summary of the number of ELL teachers, ELL aides and ELL administrators school districts have employed since SY 2006-07.

Table 3.29 ELL Related FTEs Employed in Wyoming School Districts, SY 2006-07 to SY 2014-15

School Year	ELL Teachers	ELL Aides	ELL Administrators
2005-06	14.5	18.3	
2006-07	47.2	36.8	
2007-08	51.8	43.2	
2008-09	56.1	45.3	
2009-10	54.1	47.1	
2010-11	49.7	60.3	4.0
2011-12	52.3	56.8	3.0
2012-13	54.0	55.6	3.6
2013-14	53.5	56.6	2.5
2014-15	14.5	18.3	

Source: WDE.

Additional Analysis for the 2015 Recalibration

As indicated above, ELL students currently are part of the at-risk student count, and trigger all the resources provided by at-risk student counts. However, several schools and districts have suggested the extra resources provided for ELL students are insufficient. Through various conversations and discussion at the July 1-2, 2015 Stakeholder meetings, the feelings about ELL under-resourcing largely pertained to the resourcing of one teacher position for ELL instruction for every 100 ELL students. Attendees suggested ELL students needed more resources but had overlooked the resources provided for ELL students by the at-risk count and the basic ADM funding.

[19] http://legisweb.state.wy.us/InterimCommittee/2015/SSRRpt0806Appendix18.pdf

At the meeting, we explained the EB Model recommendations provide many more resources for ELL students beyond the ELL teacher allocation. ELL students are included in the ADM count and since all ELL students are included in the unduplicated at-risk student count, resources in the EB Model for ELL students actually include:

- Tutors: one position for every 125 ELL students, or 0.80 position for every 100 ELL students;
- Extended-Day Teachers: one position for every 120 ELL students, or 0.83 position for every 100 ELL students;
- Summer School Teachers: one position for every 120 ELL students, or 0.83 position for every 100 ELL students;
- Pupil Support: one position for every 125 students, or 0.80 position for every 100 ELL students; and in addition
- ELL Teachers: one position for every 100 ELL students.

This totals nearly 4.26 positions for every 100 ELL students beyond the basic ADM resources or about one position for every 23.5 ELL students. When those at the meetings understood this, most concluded the resources for ELL students were sufficient.

2015 Evidence-Based recommendation: One position for every 100 ELL students, in addition to the tutoring, pupil support, extended-day and summer school resources.

31. Alternative Schools

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
No separate formula. Fund as any other school.	Provide funding for all staff at a ratio of 1.0 assistant principal and 1.0 teacher position for every 7 ADM.	No separate formula. Fund as any other school.	-135.37 FTE Teachers ($10,488,692) and 18.00 Assistant Principals ($1,807,754). *Note: Teacher and Assistant Principals and netted out in other resources.*

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence

A small number of students have difficulty learning in the traditional school environment. The alternative learning environment (ALE) students this report addresses are those that also have some combination of significant behavioral, social and emotional issues, often including alcohol or drug abuse. Such students often do much better in small ALEs. However, we note this rationale for a ALE does not consider alternative schools for students who simply prefer a different approach to learning academics, such as project-based learning, or more applied learning strategies that can be deployed in new CTE programs such as computer assisted engineering. The EB Model concept of alternative schools, which we believe is also the State’s concept, is for troubled youth who need counseling and therapy embedded in the school’s instructional program.

The Institute for Education Sciences at the United States Department of Education published statistics on alternative schools and programs for SY 2007-08 (Carver & Lewis, 2010). That study identified 558,300 students in 10,300 district-administered alternative education schools and programs across the United States. Although the report did not provide data on the size of these schools or on staffing ratios, the data suggest an average alternative school size of 54 students. Most of the programs served students in grades 9-12. The main reasons students were enrolled in alternative programs – all of which meet our initial definition of severe emotional and/or behavioral problems – included:

- Possession or use of firearms or other weapons;
- Possession, distribution, or use of alcohol or drugs;
- Arrest or involvement with the criminal justice system;
- Physical attacks or fights;
- Disruptive verbal behavior;
- Chronic truancy;
- Continual academic failure;
- Pregnancy/teen parenthood; and
- Mental health needs.

One of the major issues states face in creating funding programs for alternative schools is defining them. Our 2010 review of literature and state practice on alternative education provided little guidance for developing a clear definition of alternative education. More recently, and as part of implementing its compulsory attendance laws, Maryland commissioned a study to review state definitions of ALE programs (see Porowski, O'Conner & Luo, 2014). Maryland needed a definition because attendance in an ALE program was an exemption in its compulsory attendance law and the state did not have a clear definition of such programs. The study found great variation across the states in both defining and structuring alternative education programs. Because individual states or school districts define and determine the features of their alternative education programs, they tended to differ in key characteristics, such as target populations, setting, services, and structure.

A formal definition of an ALE program would need to consider the target population (including both grade levels served and types of students), program setting (within a public school or outside such a structure), program offerings (academic, behavioral, counseling, social skills, career counseling, etc.) and structure (how programs are scheduled, staff responsibilities, etc.). The Porowski, O'Conner & Luo (2014) study found wide variation across states (and districts) across all of these elements.

We have concluded the 2006 Urban Institute (Aron, 2006) definition of alternative education closely follows our understanding of such programs:

> Alternative education refers to schools or programs that are set up by states, school districts, or other entities to serve young people who are not succeeding in a traditional public school environment. Alternative education programs offer students who are failing academically or may have learning disabilities, behavioral problems, or poor attendance an opportunity to achieve in a different setting and use different and innovative learning methods. While there are many different kinds of alternative schools and programs, they are often characterized by their flexible schedules, smaller teacher-student ratios, and modified curricula.

In 2010, we also reviewed state standards – where such existed – for alternative schools. Most states use definitions similar to that of the Urban Institute, but we only identified one state, Indiana that actually established standards for what an ALE program might look like. The Indiana Department of Education's (2010) website states:

> While each of Indiana's alternative education programs is unique, they share characteristics identified in the research as common to successful alternative schools.
>
> - Maximum teacher/student ratio of 1:15
> - Small student base
> - Clearly stated mission and discipline code
> - Caring faculty with continual staff development
> - School staff having high expectations for student achievement
> - Learning program specific to the student's expectations and learning style
> - Flexible school schedule with community involvement and support
> - Total commitment to have each student be a success.

We conclude that these characteristics align with the EB Model view of ALE programs.

From work in other states, we have found that funding formulas for alternative schools differ substantially. In a few states, the typical staffing ratio for an alternative school is one administrative position for the school plus one teacher position for every eight students. Because alternative high schools are generally designed to serve students who are severely at-risk, we recommend they remain relatively small. As a result of the small size of alternative schools, staff at these schools often must fill multiple roles. Many teachers in alternative schools provide many different services for students, including: instruction, pupil support, and counseling services. This suggests the staffing structure and organization for instruction in alternative schools is usually quite different from typical high schools.

Though Wyoming could consider developing a more formal definition of its ALE system, and a set of standards for ALE programs, it does not need to do so for funding purposes. The 2015 EB Model does not have a specific alternative school formula for staff resources. Rather, the 2015 EB Model resources alternative schools in the same manner as any other school and we believe the formula provides adequate resources. However, the Legislative Model uses our previous EB Model recommendation of one assistant principal position plus one teacher position for every seven students for all staff in the building. That funding approach was intended to provide an amount of dollars to be spent on a range of staff – teachers, guidance counselors, secretaries, etc., and not all on just teachers. An additional caveat about our previous recommendation is it did not envision very large alternative schools, which Wyoming has.

Resource Use Analysis

During the recalibration process, the WDE provided more recent information on resource use for alternative schools[20]. According to the WDE's data, in SY 2013-14, there were a total of 927 ADM enrolled in 16 alternative schools in Wyoming. These 16 schools employed 53.5 more total staff than allocated through the Legislative Model. Specifically, in SY 2013-14 staffing for these 16 schools varied from the Legislative Model as shown in Table 3.30. It is important to note that the variation in teachers is a function of the way resources are generated by the Legislative Model, which as described above, provides funding for one assistant principal position for the school plus funding for one teacher position for every seven students in the school. Table 3.30 also provides a difference in expenditures reported to the WDE for alternative schools. The WDE also identified for SY 2013-14, school districts expended a total of $849,384, or 6.5% more in their alternative schools than allocated by the Legislative Model.

[20] http://legisweb.state.wy.us/InterimCommittee/2015/SSRRpt0903AppendixS.pdf.

Table 3.30 Legislative Model and District FTE Staffing Comparisons, SY 2013-14

Staff Category	Legislative Model	District Actual	Difference
School Administration	16.0	13.3	(2.7)
Teacher	132.5	102.6	(29.9)
Tutor		5.3	5.3
Aides		16.5	16.5
Pupil Support		15.8	15.8
Operations and Maintenance		19.9	19.9
Secretarial/Clerical		23.1	23.1
Librarians		1.9	1.9
School Computer Technician		3.6	3.6
Total Staff	**148.5**	**201.9**	**53.5**

Source: WDE.

Additional Analysis for the 2015 Recalibration

We have consistently advised that alternative schools are small schools established to serve children with significant behavioral, social and/or emotional issues. Alternative schools are generally located as stand-alone institutions, or as a separate part of a larger school campus. We assume these schools generally have low enrollments and require very low pupil to teacher ratios. This has become an important issue since Wyoming has lifted its moratorium on establishment of new alternative schools. Since the lifting of the alternative school moratorium, the WDE has received and approved five applications for the creation of new alternative schools. In some instances, the instructional delivery is primarily an online curriculum supported by on-site staff, which seems to be an alternative curriculum approach rather than an ALE for children who for many reasons do not function well in a traditional school setting.

In Wyoming one-third of the alternative schools have enrollments greater than 49 students[21]. A total of 925 students were enrolled in alternative schools, which equated to 1% of the total statewide enrollment. In SY 2013-14, Wyoming's 16 alternative schools employed 53.5 more FTE staff than the certified staff generated through the Legislative Model. This should not be viewed as a "problem" or an "underfunding" of the alternative school program. Stakeholders at the July 1-2 Stakeholder meetings noted that the teachers generated in the Legislative Model for alternative schools are used for many different types of staff, not just teachers; in our view this is an appropriate use of such resources. The CRERW report shows that districts employ 9.6 fewer certified staff than the Legislative Model provides, it also shows that districts employ16.5 supervisory aides and 23.1 secretarial and clerical staff, which accounts for most of the difference between certified staff positions provided and total staff hired. This staffing differentiation, however, is in line with the intent of the formula; it is assumed that with the total dollar resources provided by the alternative school formula, each alternative school would employ the mix of staff it felt was necessary, including teachers, social workers, counselors, aides and secretaries.

There is no clear research basis for staffing alternative schools, a factor complicated by the wide variety of programs offered, and the mobility of the students attending alternative schools. Our review of current literature suggests the most effective alternative schools remain small, and the funding we recommend is generally a reasonable level of resources to meet the needs of the students at those schools. The literature does not identify current information about alternative school enrollments, or best practices for staffing ratios for such schools.

[21] Of the 18 alternative schools during the 2014-15 school year, six schools had student enrollment greater than 49.

2015 Evidence-Based recommendation: No separate formula for alternative schools, fund as any other school.

32. Special Education

Providing appropriate education services for students with disabilities, while limiting costs and avoiding over-identification of students, particularly minority students, presents several challenges (see Levenson, 2012). Many mild and moderate disabilities, often those associated with students learning to read, are correctable through strategic early intervention. This intervention includes effective core instruction as well as targeted Tier 2 intervention programs, particularly one-to-one tutoring (Elements 8 and 26). For those that require special programs as identified through an IEP, the EB Model in most states relies on a census based funding formula that provides additional teaching and aid resources based on the total number of students in a school to meet the instructional needs of children with mild and moderate disabilities, and occupational, physical, speech and hearing therapy. In Wyoming, though, we continue to concur with the state's decision to provide 100 % reimbursement of approved special education expenditures.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
N/A	100% reimbursement of approved expenditures.	100% reimbursement of approved expenditures.	N/A

*The Committee did not direct further recalibration of this element and no cost differences can be computed due to limited data.

Analysis and Evidence

In their book on the best approaches to serve students with disabilities, Frattura and Capper (2007) conclude that both research and most leading educators recommend that educating students in general education environments results in higher academic achievement and more positive social outcomes for students with and without disability labels as well as being the most cost effective way to educate students. Thus, they recommend school leaders focus their efforts on preventing student underachievement and alter how students who struggle are educated. Doing so, they argue, will overcome the costly and low performance outcomes of multiple pullout programs. Further, fewer students will be inappropriately labeled with a disability, more students will be educated in heterogeneous learning environments, and higher student achievement and a more equitable distribution of achievement will result (Frattura & Capper, 2007).

The core principles of such a proactive approach to teaching students with a disability are that the education system needs to adapt to the student; that the primary aim of teaching and learning is the prevention of student failure; that the aim of all educators is to build teacher capacity; that all services must be grounded in the core teaching and learning of the school; and, that to accomplish this, students must be educated alongside their peers in integrated environments (Frattura & Capper, 2007).

Supporting this argument, research shows many mild and moderate disabilities, particularly those associated with students learning to read, are correctable through intensive early intervention. For example, several studies (e.g., Borman & Hewes, 2003; Landry, 1999; Slavin, 1996) have documented through a series of intensive instructional interventions (e.g. small classes, rigorous reading curriculum, 1:1 tutoring), nearly 75% of struggling readers identified in kindergarten and grade 1 can be brought up to grade level without the need for placement in special education. Other studies have noted decreases in disability labeling of up to 50% with interventions of this type (see for example, Levenson, 2011; Madden, Slavin, Karweit, Dolan & Wasik, 1993; Slavin, 1996).

That is why the EB Model recommendations for extended learning opportunities (Elements 26, 27 and 28) are so important; they, along with core tutoring and pupil support services, are the series of service strategies that can be deployed before special education services are needed. This sounds like a common sense approach that would be second nature to educators, but in many cases educators have heretofore been rooted in a “categorical culture” that must be corrected through professional development and strong leadership from the district office and the site principal. Using a census approach to providing most of extra resources for students with disabilities, an approach increasing in use across the country, works best for students with mild and moderate disabilities, but only if a functional, collaborative early intervention model (as outlined above) also is implemented.

This proactive approach to special education is evident in the Individuals with Disabilities Education Act of 2004, which changed the law about identifying children with specific learning disabilities. The reauthorized law states that schools will “not be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability ..." (Section 1414(b)). Instead, in the Commentary and Explanation to the proposed special education regulations, the United States Department Education encourages states and school districts to abandon the IQ-achievement discrepancy model and adopt RTI models, based on recent research findings (Donovan & Cross, 2002; Lyon et al., 2001; President’s Commission on Excellence in Special Education, 2002; Stuebing et al., 2002). An RTI model, what we call a proactive approach above, identifies students who are not achieving at the same level and rate as their peers and provides appropriate interventions, the first ones of which should be part of the “regular” school program and not funded with special education resources (Mellard, 2004).

The core features of RTI include:

- High quality classroom instruction,
- Research-based instruction,
- Classroom performance,
- Universal screening,
- Continuous progress monitoring,
- Research-based interventions, that would include one to one tutoring,
- Progress monitoring during interventions, and
- Fidelity measures (Mellard, 2004).

Common attributes of RTI implementations are: a strong core instructional program for all students, multiple tiers of increasingly intense student interventions, implementation of a differentiated curriculum, instruction delivered by staff other than the classroom teacher, varied duration, frequency, and time of interventions, and categorical or non-categorical placement decisions (Mellard, 2004). This proactive model fits seamlessly into our broader approach to helping all struggling students through early interventions.

In many instances this approach requires school-level staff to change their practice and cease functioning in silos that serve children in pullout programs identified by funding source for the staff member providing the services (e.g. General Fund, Special Education, Title I). Instead, all staff would team closely with the regular classroom teacher to identify deficits and work together to correct them as quickly as possible. This is a common sense approach that could be second nature in schools, but in many cases schools have heretofore been rooted in a categorical culture that must be corrected through professional development and strong leadership from the district office and the site principal.

For children with more severe disabilities, clustering them in specific schools to achieve economies of scale is generally the most effective strategy and provides the greatest opportunity to find ways to mainstream them (to the extent feasible) with regular education students. In very sparsely populated areas this is often not feasible but should be explored. Students in these categories generally include: severely emotionally disturbed (ED); severely mentally and/or physically handicapped; and children within the autism spectrum. The ED and autism populations have been increasing dramatically across the country, and it is likely that this trend will continue in the future. To make the provision of services to these children cost-effective, it makes sense to explore clustering of services where possible and design cost parameters for clustered services in each category. In cases where students need to be served individually or in groups of two or three because of geographic isolation, it would be helpful to cost out service models for those configurations as well, but provide full state funding for those children. This strategy would reduce the likelihood of overwhelming the financial capacity of a small school district that happens to be the home of a child with a severe disability.

The census approach to funding core special education services can be accomplished by providing additional teacher resources at a fixed level – the EB Model recommendation generally has been one teacher position and one aide position for every 150 ADM. The census approach emerged across the country for several reasons:

- The continued rise in the number and percentage of “learning disabled” and continued questioning by some of the validity of these numbers;
- Under-funding of the costs of severely disabled students;
- Over labeling of poor, minority, and ELL students into special education categories, which often leads to lower curriculum expectations, and inappropriate instructional services; and
- Reduction of paper work.

Allocating a fixed census level of staffing could meet the needs of children with mild and moderate disabilities if a functional, collaborative early intervention model such as the one outlined above can be implemented. We note the EB Model staffing for the struggling students meets this requirement.

Often, the census approach for the high incidence, lower cost students with disabilities is combined with a different strategy for the low-incidence, high-need students, whose costs are funded separately and totally by the state, as these students are not found proportionately in all districts. This is the catastrophic funding for school districts that provides resources for special education students who require services exceeding some figure, such as $15,000 (after Medicaid, federal special education grants, and other available third-party funding is applied).

Today, diverse states such as Alabama, Arkansas, California, Montana, North Dakota, Pennsylvania, and the New England states of Massachusetts and Vermont all use census-based special-education funding systems. Moreover, all current and future increases in federal funding for disabled students are to be distributed on a census basis.

It is possible that Wyoming could enhance the efficiency of its special education program if it moved to a census funding approach. To date the state has concluded that the small size of its many schools and districts would limit funding in many districts creating unanticipated funding and service concerns. As a result, the state continues to provide 100% cost reimbursement for all special education expenses.

Resource Use Analysis

Wyoming reimburses school districts for 100% of approved special education expenditures in the prior school year. For SY 2014-15, school districts were reimbursed $211,784,155 for allowable expenditures in SY 2013-14.

Additional Analysis for the 2015 Recalibration

The Select Committee on School Finance Recalibration did not direct any further recalibration of this component as part of the 2015 recalibration process.

2015 Evidence-Based recommendation: Continue using100% reimbursement of approved expenditures.

STAFF COMPENSTATION RESOURCES

There are several other issues related to the Wyoming Funding system that are not individual elements of the model, but integral aspects of costing the model. These issues include: salary levels, health insurance, other fringe benefits, regional cost adjustments, external cost adjustments and the school district school finance audit process.

33. Salary Levels

The original MAP study in 1997 and the Picus Odden and Associates recalibration in 2005 used previous year's staff salaries to put a salary "price" on each staff element of the funding model. In addition, those studies conducted an analysis of the cost of an additional year of experience for non-professional staff, and an additional year of experience as well as additional education units for professional staff. The latter allows the salary used to compute each district's funding allocation by the education and experience of the staff in that district, reflecting those differences across school districts in the state. Additionally, in the 2005 study another element for responsibility was added for school and district administrative staff. Between recalibration years, salary levels have been adjusted by(ECAs as determined appropriate by the Legislature.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference
Superintendent: Base salary $77,260; Bachelor's premium $18,613; Master's premium $24,654; Doctorate's premium $29,678; State experience per year premium $208; District per ADM premium $4.13. Assistant Superintendent: 80% of Superintendent. Business Manager: Base salary $42,446; Bachelor's premium $18,613;	Superintendent: Base salary $80,155; Bachelor's premium $19,311; Master's premium $25,578; Doctorate's premium $30,791; State experience per year premium $215; District per ADM premium $4.29. Assistant Superintendent: 80% of Superintendent. Business Manager: Base salary $44,037; Bachelor's premium $19,311;	Accept Legislative Model salaries as cost-based and used in the 2015 EB Model. Additionally, continue the labor market monitoring process currently in place.	$0

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference
Master's premium $24,654; Doctorate's premium $29,678; State experience per year premium $208; District per ADM premium $4.13. Principal: Base salary $71,645; Doctorate's premium $8,282; State experience per year premium $622; School per ADM premium $14.15. Assistant Principal: Base salary $60,459; Doctorate's premium $8,282; State experience per year premium $622; School per ADM premium $14.15. Teacher: Base salary $37,017; Master's premium $6,164; Doctorate's premium $13,449; Experience per year premium for 20 years or below $844; Experience per year premium for above 20 years $219. School Computer Technician: Base salary $38,432; Bachelor's or above premium $13,261; State experience per year premium $641. Supervisory Aide: Base salary $16,980; Bachelor's or above premium $1,977; State experience per year premium $273. School Secretary: Base salary $28,973; State experience per year premium $397.	Master's premium $25,578; Doctorate's premium $30,791; State experience per year premium $215; District per ADM premium $4.29. Principal: Base salary $74,330; Doctorate's premium $8,593; State experience per year premium $645; School per ADM premium $14.68. Assistant Principal: Base salary $60,459; Doctorate's premium $8,593; State experience per year premium $645; School per ADM premium $14.68. Teacher: Base salary $38,404; Master's premium $6,395; Doctorate's premium $13,953; Experience per year premium for 20 years or below $876; Experience per year premium for above 20 years $227. School Computer Technician: Base salary $39,873; Bachelor's or above premium $13,758; State experience per year premium $665. Supervisory Aide: Base salary $17,556; Bachelor's or above premium $2,044; State experience per year premium $282. School Secretary: Base salary $29,770; State experience per year premium $411.		

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference
School Clerical: Base salary $22,152; State experience per year premium $305. Central Office Classified: Base salary $31,269; State experience per year premium $397. Central Office Maintenance and Operations: Base salary $31,526; State experience per year premium $467. Custodian: Base salary $25,593; State experience per year premium $467. *Amounts in this column have been inflated to levels in the Legislative Model column.*	School Clerical: Base salary $22,903; State experience per year premium $316. Central Office Classified: Base salary $32,330; State experience per year premium $411. Central Office Maintenance and Operations: Base salary $32,595; State experience per year premium $483. Custodian: Base salary $26,462; State experience per year premium $483.		

Analysis and Evidence

Between the 2005 and 2010 recalibrations, salaries in the funding formula drew from the amounts established in 2005, and were increased by ECAs in SY 2007-08, SY 2008-09, and SY 2009-10. During the 2010 recalibration, it was determined the price of salaries in the Legislative Model had allowed salaries paid by school districts to rise above the market based upon a series of salary benchmarking studies. In response, the Legislature adopted a process to monitor the labor market and continue to use an inflation factor to adjust salaries, as appropriate. Since the 2010 recalibration, salaries have been adjusted by ECAs for SY 2014-15 and SY 2015-16.

It is important to note that use of the salary benchmarking studies and adoption of the monitoring process in 2010 moved the state away from a basing salaries upon historical salaries paid by school districts and into one in which the "price" of salaries embedded in the Legislative Model is compared to appropriate labor markets. The 2010 recalibration determined the salary levels embedded in the Legislative and EB Models exceeded what the labor market demanded. Further, the 2010 recalibration established a process for the Legislature to annually monitor salaries to ensure they continued to meet or exceed the demands of the market while still providing for experience, education and responsibility cost adjustments for each school district.

Additional Analysis for the 2015 Recalibration

For the 2015 recalibration, Wyoming retained Dr. Christiana Stoddard to analyze all model salaries with respect to appropriate labor markets, to assess the degree to which Wyoming was recruiting and retaining high talent for the education system, and to determine if turnover rates were average or not.

The report (Stoddard, 2015) included an extensive analysis of teacher salaries and comparison of Legislative Model and actual salaries to a number of different market indicators. The report compared Legislative Model salaries to teacher salaries in other states in the region, to all college graduates, to professional and technical workers and to workers with similar knowledge and skills and work tasks to teachers. The results were quite clear: the Legislative Model teacher salaries are generally at or above these market indicators.

These results lead us to conclude Legislative Model salaries for teachers for SY 2015-16 can be determined market based and those teacher salaries can also be used in the 2015 EB Model for the 2015 recalibration effort. These salaries should be subject to an appropriate ECA as determined by Wyoming's labor market monitoring process.

Stoddard's report generally concluded that all other Legislative Model salaries were also market based, although it was difficult to find good comparisons for some educational jobs such as superintendents.. Stoddard found that nearly all non-teacher salaries were at or above similar government jobs.

Those results lead us to conclude that Legislative Model salaries for all non-teacher positions are at or above market and can be also be used in the 2015 EB Model for the 2015 recalibration effort. As with teachers, these salaries should be subject to an appropriate ECA as determined by Wyoming's labor market monitoring process.

We also recommend the continuing the labor market monitoring process to make sure broader economic conditions do not push salary levels off their market based position today and create salary distortions before the next recalibration effort.

2015 Evidence-Based recommendation: Accept Legislative Model salaries as cost-based and used in the 2015 EB Model. Additionally, continue the labor market monitoring process currently in place.

34. Health Insurance

Wyoming has taken a clear and substantive approach to addressing the costs of health insurance in education staff compensation. Specifically, the funding includes for each eligible employee the dollar amount for health insurance benefits equal to the average amount Wyoming provides for its State employees. This dollar amount is provided for every staff position in the Legislative Model. The implicit signal is the State encourages school districts to provide health insurance support for almost every employee, just as the State does for its employees.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference
Compute a health insurance composite amount for each generated FTE based upon prior year statewide average district weighted actual participation in district health insurance plans as to the proportion of employee only, split contract, employee plus spouse or children and family coverage for the State's health insurance contribution amounts paid on behalf of State employees as of January 1 of the preceding school year. For FY 2011-12 the per FTE amount is $12,804.59. *Amount in this column has been inflated to levels in the Legislative Model and 2015 EB Recommendation columns.*	Compute a health insurance composite amount for each generated FTE based upon prior year statewide average district weighted actual participation in district health insurance plans as to the proportion of employee only, split contract, employee plus spouse or children and family coverage for the State's health insurance contribution amounts paid on behalf of State employees as of January 1 of the preceding school year. For FY 2015-16 the per FTE amount is $14,958.29.	Compute a health insurance composite amount for each generated FTE based upon prior year statewide average district weighted actual participation in district health insurance plans as to the proportion of employee only, split contract, employee plus spouse or children and family coverage for the State's health insurance contribution amounts paid on behalf of State employees as of January 1 of the preceding school year. For FY 2015-16, the per FTE amount is $14,958.29.	$0

Analysis and Evidence for the 2015 Recalibration

The EB and Legislative Models are in agreement on this approach to supporting health insurance. The historical health insurance resources included in the funding formula are listed in Table 3.31.

Table 3.31Historical Model Amount for Health Insurance per FTE, SY 2006-07 to SY 2015-16

School Year	Model FTE Amount	Prior Year $ Change	Prior Year % Change
2006-07	$8,169		
2007-08	$9,468	$1,299	15.90%
2008-09	$9,562	$94	0.99%
2009-10	$9,801	$239	2.50%
2010-11	$10,489	$688	7.02%
2011-12	$12,805	$2,316	22.08%
2012-13	$13,180	$376	2.93%
2013-14	$12,523	($657)	-4.99%
2014-15	$13,129	$606	4.84%
2015-16	$14,958	$1,829	13.93%

Source: Legislative Models.

Wyoming is unique among the states in that it has an explicit policy for including health care insurance support in the school funding formula by providing an amount equal to the amount provided for health insurance support for State employees. The amount shown represents approximately 85% of health insurance costs, and assumes employees – both State and local school district employees –pay the remaining 15%. Wyoming's policy on health insurance also includes a provision allowing any school district to opt into the State health insurance plan, the costs of which would be covered by the Legislative Model funding formula amount. The only additional stipulation is if a district opts into the State plan, then eligibility requirements to participate in the health insurance plan are no longer controlled by the school district, but by the State's plan and the school districts must adhere to the State's insurance requirements for participation. Generally this makes more employees eligible for health care insurance.

Analysis of Wyoming school district expenditures show most districts spend less on health insurance than they receive from the Legislative Model. Table 3.32 is a statewide summary of health insurance resources provided by the Legislative Model and school district expenditures from the general fund for health insurance. Special education and transportation expenditures for health insurance are covered in the 100% reimbursement for those costs and are excluded from column 3 in Table 3.32, but are included in column 7, which shows the total Legislative Model funded costs for health insurance.

Table 3.32 Legislative Model Health Insurance Expenditure Analysis

(1)	(2)	(3)	(4)	(5)	(6)	(7)
School Year	**Model Health Insurance Funding**	**School District Health Insurance Expenditures Less Special Education and Transportation[1]**	**Difference Between Model and Actual Expenditures**	**Percent Difference**	**Special Education and Transportation Expenditures for Health Insurance**	**Total Model Health Insurance and Special Education and Transportation Funding (Col. (2) plus Col. (6))**
2006-07	$92,099,184	$88,510,435	($3,588,749)	96.10%	$19,397,360	$111,496,544
2007-08	$106,877,460	$88,811,798	($18,065,662)	83.10%	$21,248,032	$128,125,492
2008-09	$108,637,971	$96,098,625	($12,539,346)	88.46%	$22,632,344	$131,270,315
2009-10	$112,521,857	$108,205,405	($4,316,452)	96.16%	$27,083,951	$139,605,808
2010-11	$121,730,508	$110,722,363	($11,008,145)	90.96%	$28,200,612	$149,931,120
2011-12	$150,261,535	$122,555,090	($27,706,445)	81.56%	$31,107,345	$181,368,880
2012-13	$156,366,504	$127,644,956	($28,721,549)	81.63%	$32,507,456	$188,873,960
2013-14	$150,289,624	$126,343,050	($23,946,574)	84.07%	$33,488,194	$183,777,817

Source: WDE601 Annual District Report, General Fund, Objects 23x and 27x excluding special education and transportation functions 1210,1250,2230,3510, and 3520.
Notes: [1] Sublette #9 funded $7,905,000 and $1,822,685 in 2006-07 and 2007-08 respectively in prepaid HRA expenses with rebated recapture funds.

For SY 2013-14, column 4 of Table 3.32 shows, in total, districts spent $23.9 million less on health care insurance for employees than they received. One possible explanation for this difference is a few districts are able to provide comprehensive health insurance at a lower cost than the cost of the State's program. Another possible explanation is that some school district employees elect not to take health insurance coverage choosing instead to use coverage available through their spouse. Efficiencies of this type should be encouraged. A third explanation is that most districts hire fewer staff than the model provides, so even if all staff actually hired have health insurance, districts expenditures for that purpose will be lower than the model provides since funding for health insurance in the model is based on model generated positions, not the actual number of positions in each district. Fourth, many lower paid employees in school districts are not offered health insurance. In some cases, this is because they have only a part time job in the district; in other cases, it might be because they cannot afford the employee portion of the coverage. Regardless of the reasons, it appears at the present time, the Legislative Model's funding for health insurance is more than sufficient to ensure all eligible employees have health insurance coverage.

To bolster these assertions, Table 3.33 summarizes across the 48 districts: total Legislative Model FTEs; actual staff counts*;* and actual staff FTEs enrolled in school district health insurance plans. These data exclude the special education and transportation staff and only include State funded positions. Prior to SY 2011-12, the WDE could not identify federal funded or other funded positions, thus the analysis is able to cover only school years beginning with 2011-12.

Table 3.33 School District Employee Participation in District Health Insurance Plans

(1) School Year	(2) Total Model FTE	(3) Enrolled Staff Count in School District Health Insurance Plans[1]	(4) Staff Count Difference from Model FTE	(5) Staff Count as % of Model	(6) Enrolled Staff FTE in School District Health Insurance Plans	(7) Staff FTE Difference from Model FTE	(8) Staff FTE as % of Model
2011-12	11,735	10,330	(1,405)	88.03%	9,330	(2,405)	79.51%
2012-13	11,864	10,224	(1,640)	86.18%	9,284	(2,580)	78.26%
2013-14	12,001	10,378	(1,623)	86.47%	9,320	(2,682)	77.66%

Source: WDE602 Staff Member Collection, State funded positions (S) excluding special education and transportation assignment codes; Statewide Payment Models
Notes: [1] Beginning with SY 2011-12, refinements in staff data allow for the identification of State funded staff enrolled in district health insurance programs.

Table 3.33 includes total Legislative Model staff FTE (column 2), the count of staff enrolled in district health insurance programs (column 3), the absolute difference (column 4) and percent difference (column 5) between these two figures. This count includes several part time staff positions. Column 6 shows enrolled staff as FTE positions, and columns 7 and 8 show the absolute and percent difference of FTE staff from the Legislative Model. The data show in SY 2013-14, 2,682 FTE positions were funded for health care insurance, but not enrolled in district provided health care insurance. This is a major explanation for why actual district expenditures for health care insurance are substantially less than the resources provided by the Legislative Model.

It would be preferable if health care insurance resources provided were closer to actual expenditures. There are several options to accomplish this objective. One would be to require all districts to cover all employees, even part time employees who work at least half time or 20 hours a week. A second would be to require all districts to opt into the State program; this would dramatically increase the number of individuals in the State program, which may have the additional benefit of reducing the cost of the program. A third would be to provide districts reimbursement for their actual expenditures on health care insurance up to the amount generated by Legislative Model. Irrespective of these options, actual health insurance expenditures would be closer to resources provided if districts hired staff across all staffing categories more in line with the EB Model recommendations.

2015 Evidence-Based recommendation: Include a fixed amount for health care insurance as a benefit in compensation for all staff in the model. The amount should be the average that the State pays for State employees weighted based upon school district employee participation in their own plans. For 2015-16, this amount was $14,958 per model FTE.

35. Benefits

In determining staff costs, the Legislative Model generates a specific salary for various positions for each school district and adds to that figure the costs of employee benefits beyond health insurance (Element 34). These benefits include worker's compensation, unemployment insurance, State retirement, Social Security and Medicare.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Worker's Compensation: 0.70% of salary.	Worker's Compensation: 0.70% of salary.	Workers' Compensation: 0.70% of salary.	$0
Unemployment Insurance: 0.06% of salary.	Unemployment Insurance: 0.06% of salary.	Unemployment Insurance: 0.09% of salary.	*Note: estimate is variable to salary and FTEs*
Retirement: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share).	Retirement: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and reimburse actual expenditures as required by current law (1.25% employer share and 0.375% employee share – FY 2016-17 only).	Retirement: 12.69% of salary within the block grant (7.12% employer share and 5.57% employee share) and State decide on reimbursement of additional retirement costs currently reimbursed (1.25% employer share and 0.375% employee share – FY 2016-17 only).	$0
Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).	$0

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Wyoming takes a cost-based approach to all of these benefit costs and we recommend the State continue this approach.

Analysis and Evidence for the 2015 Recalibration

The four elements are discussed below: worker's compensation, unemployment insurance, state retirement and Social Security and Medicare.

Worker's Compensation

Worker's Compensation is currently 0.70% of salaries. After discussion with WASBO, they recommend changing this to 0.80% citing recent increases.

School district actual expenditures on worker's compensation (less reimbursable costs for special education and transportation) as a percentage of total salaries have fluctuated from 0.68% in SY 2005-06 to 0.79% in SY 2013-14, as Table 3.34 shows. Until the recent high point in SY 2013-14, the percentage was less than the 0.70% in the formula every year dropping to under 0.50% in two of those years, and under 0.60% in two other years. This figure could very well drop from the SY 2013-14 level of 0.79% in future years so increasing the formula figure to a higher level might be premature. Although this figure can be recalculated every year and put into the funding formula for each succeeding year, the amount is so small that this fine-tuning is not warranted. We recommend leaving worker's compensation rate at 0.70% of salaries and monitoring the figure for possible change in the future.

Table 3.34 Worker's Compensation and Unemployment Insurance Expenditures as a Percent of Salaries (Excluding Special Education and Transportation), SY 2005-06 to SY 2013-14

School Year	1xx - Personal Services-Salaries	24x –Worker's Compensation	Worker's Compensation % of Salaries	25x - Unemployment Insurance	Unemployment Insurance % of Salaries
2005-06	$435,311,184	$2,951,015	0.68%	$293,324	0.07%
2006-07	$523,363,552	$3,254,669	0.62%	$244,557	0.05%
2007-08	$556,893,323	$3,406,048	0.61%	$304,154	0.05%
2008-09	$587,130,728	$3,205,398	0.55%	$413,554	0.07%
2009-10	$608,638,827	$2,726,083	0.45%	$743,264	0.12%
2010-11	$615,455,747	$2,892,718	0.47%	$842,903	0.14%
2011-12	$631,176,740	$3,510,832	0.56%	$683,980	0.11%
2012-13	$640,338,442	$4,287,538	0.67%	$924,930	0.14%
2013-14	$650,377,810	$5,139,535	0.79%	$642,598	0.10%

Source: WDE WDE601 Annual Report. General Fund Salaries and Worker's Compensation Benefits and Unemployment Benefits Excluding Special Education and Transportation Reimbursements (Functions: 1210, 1250, 2230, 3510 and 3520)

Unemployment Compensation

Unemployment Insurance is currently 0.06% of salaries. WASBO recommends changing this to 0.09%.

School district expenditures on unemployment compensation (less reimbursable costs for special education and transportation) as a percentage of total salaries have fluctuated from 0.05% in SY 2006-07 to 0.10% in SY 2013-14, as Table 3.34 shows. Such expenditures were 0.05% in SY 2006-07 and SY 2007-08, but during the past six years the percentage has been 0.12, 0.14, 0.11, 0.14 and 0.10%, so it seems the costs of unemployment compensation is rising. The WASBO recommendation of 0.09% seems a reasonable. Although the data exist to update this percentage every year, we believe the effort is not warranted. We recommend increasing the benefit percentage for unemployment insurance to 0.09% and leaving it constant until the next recalibration. This would increase the Legislative Model by an estimated $191,700 for SY 2015-16.

Retirement

Wyoming has enacted some short-term changes in the State retirement program. At present, the 12.69% of salary for retirement benefits is funded inside the Legislative Model. However, the State currently funds short-term changes in these percentages outside the Legislative Model. In particular, for SY 2014-15, the State reimbursed school districts an additional 0.625% for employee contributions and 0.50% for employer contributions. For SY 2015-16, the employer contribution will increase another 0.75% and the State will reimburse that cost. In SY 2016-17, the State will reduce the reimbursement for the employee contribution by 0.25%. In SY 2017-18 and beyond, the employee contribution reimbursement level will be reduced another 0.375%.

The issue is whether to fund changes in retirement contributions "inside" or "outside" the block grant. As noted above, during the past few years, temporary increases in the employer portion of retirement benefits have been funded outside the block grant because it requires less State money. The lower cost is largely because districts hire fewer staff than resourced. On the other hand, districts generally pay staff more than the Legislative Model provides, so while incremental retirement costs today are less if funded outside the Legislative Model, that fact could change in the future. This would not be an issue if districts hired and paid staff more in line with what the Legislative Model provides. But until that time, we see no problem with the Legislature funding incremental retirement costs outside the block grant. That ensures that what they spend appropriately reimburses districts for required increased costs. We recommend the current 12.69% of salaries for employer retirement costs be funded inside the block grant and that the State decide on whether to fund incremental costs above that figure inside or outside the block grant.

Social Security and Medicare

The rates for Social Security (6.2% of salary) and Medicare (1.45% of salary) have not changed, and should be retained at those percentages in the Legislative Model. Any changes in Social Security, including the maximum salary, and Medicare should immediately be included in the Legislative Model.

2015 Evidence-Based recommendation: For employee benefits, other than health insurance provide

- Worker's Compensation: 0.70% of salary;
- Unemployment Insurance: 0.09% of salary;
- State Retirement: 12.69% (7.12% employer and 5.57% employee) inside the block grant and continued reimbursement of incremental changes outside the block grant; and
- Social Security and Medicare: 7.65% (6.20% for Social Security and 1.45% for Medicare).

36. Regional Cost Adjustments (RCAs)

Regional cost adjustments are designed to compensate districts for the varying purchasing power of the education dollar across geographic regions of the state, particularly for professional staff salaries.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
Adjust salaries by the 2011 Hedonic Wage Index (HWI) as calculated in Dr. Lori Taylor.	Provide the greater of the 2005 Hedonic Wage Index (HWI) or the average of the last six Wyoming Cost of Living Indices (WCLI), with a minimum of 1.0	Adjust salaries by the 2015 OES CWI as calculated in Dr. Lori Taylor's report to the Select Committee.	Evidence-Based RCA: 2015 OES CWI: Cumulative difference of ($3,432,407).

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	*Estimated Cost Difference
	(statewide average).		Legislative Model RCA: Greater of 2005 HWI or WCLI: Cumulative difference of $32,632,729 Net difference in RCAs is ($36,065,136)

*The source for all cost differences reported in this chapter is a simulation model developed specifically during the 2015 recalibration process.

Analysis and Evidence for the 2015 Recalibration

Economists and the school finance policy community generally agree that the purchasing power of the education dollar varies across geographic regions of a state. Over the past 30-40 years, therefore, the policy community has developed a variety of approaches to quantify these cost differences to facilitate the use of a "cost index" to adjust state aid allocations to ensure the equal purchasing power of each school district's personnel dollars. For many years, the hedonic wage index (HWI) approach was used to develop such cost indices. During the past ten years, however, a comparable wage index (CWI) approach was also developed and has assumed strong support among the school finance community.

The Legislative Model uses an RCA approach that is the greater of the HWI that was developed in the 2005 recalibration or the Wyoming Cost of Living Index, with a minimum index of 100 (statewide average). We view this approach as more a compromise policy than a RCA.

For the 2015 recalibration, Wyoming retained Dr. Lori Taylor (see Taylor 2015) to analyze RCA options and make a recommendation for an RCA to use in the 2015 EB Model. We recommend that Wyoming use the new OES CWI developed by Taylor.

2015 Evidence-Based recommendation: Adjust salaries for regional differences by using the 2015 0ES CWI as calculated by state consultant Dr. Lori Taylor, with the state average set at 100.

ADDITIONAL ISSUES RELATED TO THE WOMING K-12 FUNDING MODEL

There are other issues we reviewed as part of the recalibration effort. These included ECA recommendations and the school finance audit process by the Wyoming Department of Audit.

37. External Cost Adjustments (ECAs)

External cost adjustments are factors used to adjust the cost-basis of elements to ensure the state continues to provide the statutorily required educational program to Wyoming school children in the time period in between the formal recalibrations.

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference
Monitoring process established by W.S. 21-13-309(u). Recommended cost indices include: • Professional staff – use a Wyoming specific Comparable Wage Index; • Non-professional staff – use a Wyoming specific High School Comparable Wage Index; • Supplies and Materials – use the Producer Price Index for Office Supplies and Accessories; and • Energy – use the Producer Price Index (PPI) for Commercial Electric Power (weighted at 44.1%) and the PPI for Commercial Natural Gas (weighted at 55.9%).	Monitoring process established by W.S. 21-13-309(u). Recommended cost indices include: • Professional staff – use a Wyoming specific Comparable Wage Index; • Non-professional staff – use a Wyoming specific High School Comparable Wage Index; • Supplies and Materials – use the Producer Price Index for Office Supplies and Accessories; and • Energy – use the Producer Price Index (PPI) for Commercial Electric Power (weighted at 44.1%) and the PPI for Commercial Natural Gas (weighted at 55.9%).	Monitoring process established by W.S. 21-13-309(u). Recommended cost indices include: • Professional staff – use a Wyoming specific Comparable Wage Index; • Non-professional staff – use a Wyoming specific High School Comparable Wage Index; • Supplies and Materials – use the Producer Price Index for Office Supplies and Accessories; and • Energy – use the Producer Price Index (PPI) for Commercial Electric Power (weighted at 28.12%), the PPI for Commercial Natural Gas (weighted at 59.41%) and PPI for Gasoline (weighted at 11.83%).	N/A

Analysis and Evidence for the 2015 Recalibration

Following the 2010 recalibration, Wyoming developed what is likely the most sophisticated ECA approach in the country with the assistance of Dr. Lori Taylor:

- One for professional staff, using a Wyoming specific Comparable Wage Index
- One for non-professional staff, using a Wyoming specific High School Comparable Wage Index
- One for materials, using the Producer Price Index for Office Supplies and Accessories
- One for energy, using the Producer Price Index for Commercial Electric Power (weighted at 44.1%) and the Producer Price Index for Commercial Natural Gas (weighted at 55.9%).

The Legislature reviews these indices in years between recalibration as part of the monitoring process established in W.S. 21-13-309(u).

For the 2015 recalibration, Wyoming had Dr. Lori Taylor reanalyze the current ECA options and make recommendations (see Taylor 2015). Dr. Taylor recommended a slight change to the energy index by adding gasoline to the weighted index.

2015 Evidence-Based recommendation: Continue to their annual monitoring process in years between recalibration and provide a four-part annual ECA:

- Professional staff, using a Wyoming specific Comparable Wage Index
- Non-professional staff, using a Wyoming specific High School Comparable Wage Index
- One for materials, using the Producer Price Index for Office Supplies and Accessories
- One for energy, using the Producer Price Index for Commercial Electric Power (weighted at 44.1%) and the Producer Price Index for Commercial Natural Gas (weighted at 55.9%).

38. School District School Finance Audit Process

The operation of the Legislative Model requires the use of several pieces of data at both school and district levels. Additionally, the WDE collects data from school districts, promulgates rules and regulations on various model elements, and administers the statewide payment model to ensure accurate funding to school districts. In order for the formulas to work as legislatively intended, every data element in the formula must be accurate. To ensure this is the case, each year the Wyoming Department of Audit conducts audits in a sample of school districts to ensure the data reported to the WDE are accurate, school districts are following the law, and the WDE inputs the data into the statewide payment model accurately. Several data points are audited, including, for example, the following:

- Number of students (ADM);
- Number of CTE students, and number of CTE teachers;
- Average teacher experience and education units;
- School facilities data from the SFD; and
- Reimbursable special education and transportation expenditures.

The audit findings are then sent to the WDE. When the audit identifies inaccuracies, it is the WDE's responsibility to determine if changes in state aid allocations are warranted – to either increase or decrease district funding depending on the finding. This clearly is a needed process and should continue. No funding formula can work as intended unless the data it uses are accurate.

We strongly recommend that the school district school finance audit process be continued. We further recommend the WDE to periodically review the rules and regulations for the Legislative Model and guidance concerning data needs from each district to operate the statewide payment model, especially after a recalibration.

2015 Evidence-Based recommendation: Continue with the school finance audit process

Chapter 4
Additional Items the 2015 Select Committee Requested be Analyzed

This chapter addresses two items identified by the 2015 Select Committee on School Finance Recalibration for costing analysis, including the following: Preschool and School Resource Officers (SROs). Additionally, we have reviewed the 2015 Distance Education Task Force report and offer guidance on any additional cost implications.

PRESCHOOL

At the Select Committee's meeting on May 21 & 22, 2015, we were asked to provide cost estimates of a preschool program. This request recognizes that prior Wyoming Supreme Court rulings specifically excluded preschool programs from the state's definition of adequacy. This section describes the EB recommendations for a preschool model and provides cost estimates for providing preschool programs in Wyoming.

Preschool education has received considerable attention in recent years, including a major push to expand preschool education by the federal government. Moreover, there is growing evidence high quality preschool programs are an effective way to help all children succeed in school (Kauerz, 2006). Often, it is not a component of school finance adequacy studies because, like Wyoming, many state constitution education clauses do not directly address education for children who are less than five or six years old.

Preschool programs are most effective for at-risk children who are not likely to come to kindergarten fully prepared. When paired with well-resourced elementary schools, preschool programs can help at-risk children catch-up with their better-prepared schoolmates (Takanishi & Kauerz, 2008). This same research suggests that at-risk children who attend preschool programs are less likely to catch up to their peers in low-resourced elementary schools. Wyoming is fortunate its elementary schools are amply resourced through the Legislative Model (Odden & Picus, 2014; Picus, Odden & Goetz, 2009). This suggests an investment in preschool programs may result in a high return in terms of improved future student performance.

There is growing recognition that integrating preschool programs with the traditional public school system, particularly grades K-3, could strengthen the effect of both preschool programs and programs in grades K-3. This analysis of preschool for Wyoming focuses on estimating the structure and costs of establishing universally available, voluntary, high quality programs for three- and/or four-year-olds. It discusses how those preschool programs would be integrated with existing K-3 programs Wyoming already funds.

The balance of this section is divided into six segments. The first briefly summarizes the research base supporting preschool education programs, the second summarizes research on the impact of a statewide preschool program, the third summarizes fiscal returns to preschool programs, and the fourth identifies the research base for integrating preschool programs with K-3 programs into a more unified PreK-3 program. The fifth describes the EB approach to providing for preschool programs. The sixth discusses how to identify how much additional money would be required for Wyoming to fund preschool programs under the EB recommendation.

The Case for Preschool

There is continued activity across the United States to establish universal preschool programs for 4-year-old children and in increasing numbers of instances for 3-year-olds as well. This activity stems from the increased demands on schools through standards-based education reforms, the expectations for which have now been ratcheted up to include preparing all students for college or careers, and a growing recognition that early childhood development programs can have an impact on student outcomes well beyond the preschool years. Much of the research on the effectiveness of PreK-3 programs has focused on the preschool component, with less research on the advantages of integrated programs that continue from preschool through the grade 3.

Drawing from a number of major studies that found long-term positive effects of preschool programs on student learning, Reynolds and Temple (2008) constructed five possible pathways through which early childhood development programs produced their impacts, including:

- A cognitive advantage pathway that leads to enhanced literacy, language and numeracy skills, and better school readiness (see also Conger, 2008 for evidence on the impact of early learning on acquisition of English language skills for ELL students).
- A family support pathway describing benefits from greater parental involvement in education and enhanced parenting skills (see also Kalil & Crosnoe, 2008).
- A school support pathway that argues for high quality education programs beyond preschool to strengthen the learning advantages of early childhood development programs, a pathway allowed by the Wyoming funding system.
- A social adjustment pathway suggesting benefits from increased classroom and peer social skills and positive teacher-child relationships.
- A motivational pathway arguing that early education programs provide benefits in terms of achievement motivation and commitment to school.

Whatever the pathway, most researchers find that high quality preschool, particularly for students from lower income backgrounds, significantly affects future student academic achievement as well as other desired social and community outcomes (Barnett, 2008, 2010, 2011a, 2011b; Camilli, et al., 2010; Pianta, et al., 2012; Reynolds, et al., 2001, 2011; Reynolds and Temple, 2006, 2008; Schweinhart et al., 2005). These longitudinal studies show that students from lower income backgrounds who experience a high quality, full-day preschool program perform better in learning basic skills in elementary school, score higher on academic goals in middle and high school, attend college at a greater rate, and as adults, earn higher incomes and engage in less socially-undesirable behavior.

In specifying more specific positive impacts, Lynch (2007) and a more recent report from the Education Commission of the States (Workman, Griffith & Atchison, 2014) identify the multiple benefits of preschool programs for children who participate in high quality preschool programs:

- Require less special education;
- Are less likely to repeat a grade;
- Are less likely to need child welfare services;
- Enroll in K-12 education better prepared resulting in lower spending on extra help services;
- Are less likely to engage in criminal activity as juveniles and adults;
- Are less likely to need social welfare support services as adults;
- Generally have higher incomes when they enter the labor force;
- Pay higher taxes as a result of their higher incomes, and
- Are likely to have employer-provided health insurance.

The consistent and recurring theme in the analyses is the multiple benefits and long-term savings accrue to high quality preschool programs. Although a high quality program is defined to a large extent by the individuals employed to run the program and their commitment to their job, as well as a comprehensive array of services beyond the school component, it is possible to identify the resource levels needed to support such high quality programs.

Russo (2007) identified the components of high quality, effective PreK-3 programs as:

- Voluntary, full-day preschool-kindergarten available to all 3-and 4-year-old children.
- Full-day kindergarten that builds on preschool experiences and is available to all children, which is supported by the current Legislative Model.
- Standards, curriculum, instruction, and assessments aligned within and across grades from preschool through grade three, which can be accomplished with new curriculum standards.
- Curriculum focused on emotional development, social skills, and self-discipline, as well as reading and mathematics.
- Early education lead teachers qualified to teach any grade level from preschool through grade 3 and compensated based on public elementary school teacher salaries.
- Families and teachers who work together to ensure the success of all children.

More recently, the National Institute for Early Education Research (NIEER) has established 10 quality benchmarks to identify program quality. NIEER's ten high quality preschool program standards are similar to the above and include:[22]

1. Comprehensive learning standards;
2. Teachers with a bachelor's degree;
3. Teachers with specialized training in early childhood;
4. Assistant teachers with an Child Development Associate credential or the equivalent;
5. Teacher in-service training of at least 15 hours per year;
6. Maximum class sizes of 20 or less;
7. Staff to child ratios of 1 to 10 or better;
8. Vision, hearing and health screening and referral and support services;
9. At least one meal per day provided; and
10. Site visits to ensure program quality.

Nearly all of the longitudinal, randomized controlled studies of preschool programs have relied on data from three preschool programs that met the above standards: High-Scope Perry Preschool Program, Carolina Abecedarian Project and the Chicago Child-Parent Center Program. These results reinforce the finding that the most robust impacts of preschool programs are those that emerged from studies of the effect of high quality programs.

In sum, high quality preschool, offered for a full day and taught by fully certified and trained teachers using a rigorous, but appropriate early childhood curriculum, can provide initial positive effects and even greater effects in later primary years. By themselves, preschool programs can reduce achievement gaps linked to race and income by half. And the effect of preschool programs can be enhanced if followed by high quality education programming in the elementary grades, particularly grades K-3.

Furthermore, there is increasing recognition that preschool should be provided for *all students*. Research shows that this strategy produces significant gains for children from middle class backgrounds and even larger impacts for students from lower income backgrounds (Barnett, Brown & Shore, 2004).

---

[22] See http://nieer.org/yearbook/compare/ for a detailed description of the NIEER quality standards.

Impact of Statewide Preschool Programs

Researchers have also analyzed the success of larger, more universal, i.e., statewide, preschool initiatives. A 2003 study of state-funded preschool programs in six states – California, Georgia, Illinois, Kentucky, New York and Ohio – found that children from lower income families start catching up to their middle income peers when they attend a preschool program (Jacobson, 2003). There is evidence that statewide universal programs in Georgia (Henry, et. al. 2006), and Oklahoma (Gromley, Jr. et. al. 2005) have improved the performance of students who participated in those programs. In addition, a 2007 study showed that preschool programs in New Jersey's urban districts had not only significant short-term cognitive and social impacts, but also long term, positive impacts on students who enrolled in them, closing the achievement gap by 40% in second grade for a two year preschool program (Frede, Jung, Barnett et al., 2007).

Fiscal Returns to Preschool

Generally, estimates of the long-term financial benefits of preschool programs are reported as returns on investment. Reynolds and Temple (2008) reported that in addition to benefits to child well-being and student achievement, high quality preschool programs for low-income children at-risk for underachievement produced economic returns ranging from $4 to $10 per dollar invested. Others make similar arguments. Indeed, several studies conclude that there is a return over time of eight to ten dollars for every one dollar invested in high quality preschool programs (Barnett, 2007; Barnett & Masse, 2007; Karoly et al., 1998; Reynolds et al., 2011; Zigler, Gilliam & Jones, 2006; and Gromley, 2007).

In a more detailed analysis, Lynch (2007) found that voluntary, high quality, publicly funded preschool programs targeted to the poorest 25% of three-and four-year old children generate substantial benefits that would eclipse the costs of the programs in six years. By 2050, Lynch estimated that the annual benefits of these preschool programs would exceed the program costs in that year by a ratio of 12.1 to 1. He estimated the cost of a high quality half-day program at $6,300 (2006 dollars) for each of the 2 million children enrolled. He further estimated that if programs were funded by individual states (rather than the Federal Government), by 2050, all 50 states would realize net benefits in tax revenues from the programs in between four and 29 years.

Further, Lynch (2007) estimated that if a voluntary, high quality publicly funded universal half-day preschool program for three-and four-year-olds were established, budgetary savings would surpass costs in about nine years and by 2050, benefits would exceed costs by an 8.2:1 ratio. He assumed these preschool programs would also cost approximately $6,300 (2006 dollars) per student and when fully phased in would enroll approximately 7 million children.

The Case for Integrated PreK-3 Programs

The discussion above considered preschool programs, but said little about PreK-3 programs or their benefits. While there is growing evidence that integrating preschool programs with primary grades can lead to increased educational benefits, this field has been less explored.

Takanishi and Kauerz (2008) argue that the PreK-3 years are the cornerstone of any educational system, and point out the importance of quality integrated PreK-3 programs in providing strong foundations for lifelong learning, educational excellence and competitiveness in the marketplace. Bogard (2003) suggests that variability in preschool experiences is a strong predictor of children performance, and the link is even stronger for low-income children. She suggests that a PreK-3 approach to early childhood education will help to level the playing field by supporting better teacher preparation and qualifications, as well as establishing sequential learning experiences.

One of the challenges when considering PreK-3 programs is coordinating traditional education programs. This takes on a number of dimensions. First, the need to coordinate education programs (curriculum, professional development, teacher collaboration, school facilities) becomes more complex with the addition of more staff, students and grade levels. An efficient way to help such coordination is to make preschool teachers part of a PreK-3 teacher collaborative team. Second, many preschool programs are offered by providers other than the public school system – frequently at sites other than the local school. Finally, coordinating preschool with the regular K-3 program is further complicated by the fact that in the foreseeable future, preschool programs will remain voluntary. This means some children will continue to come to kindergarten without the benefit of preschool programs, and other children who have had access to preschool programs will bring very different experiences to the first years of formal schooling. The success of a PreK-3 program also depends on the quality of the educational program in grades K-3, which varies across schools, school districts and even states, but should be high quality in all Wyoming schools. This study addresses that issue by using an EB Model to estimate the resources needed for a high quality program in all PreK-3 classrooms, with the K-3 programs already covered by the Legislative Model.

Many of the components of success for high quality preschool programs are also part of the components advocated by PreK-3 supporters. These include full-day programs with low pupil/teacher ratios staffed by highly qualified teachers and aides, along with support for articulating curriculum, professional development, teacher collaboration and educating children with special educational needs.

In earlier research, Picus, Odden and Goetz (2009), as part of an overall effort to estimate costs for PreK-3 programs nationwide, developed case studies of several integrated preschool programs. The case studies showed that such programs were provided in regular elementary school settings; often organized schools into PreK-1, grades 2 through 3, and grades 4 through 5 collegial teacher teams; provided preschool teachers with the same pupil-free time as the grade level elementary teachers so they could all meet during the regular school day for collaborative planning; integrated the preschool through grade 1 curriculum; and generally augmented a K-5 elementary school with an additional one to three preschool classrooms. Most of the preschool classrooms were staffed with one teacher and one aide for every 15-20 students.

In addition, and as recommended by the NIEER standards, such programs had classroom teachers that were fully certified as early childhood educators and paid on the same salary schedule as the other teachers in the school and school system. It should be expected that many of the components of a high quality preschool program are part of the EB Model developed for K-3 programs in a number of states, including Wyoming. Indeed, as indicated above, preschool impact is linked to quality and quality is largely a function of staff (Camilli, et al., 2010; Whitebrook, 2004). Therefore, including preschool students in a district's pupil count for state aid purposes and including preschool teachers on the same salary schedule as teachers of other grades is the most straight-forward way to fund preschool services.

The Evidence-Based (EB) Method to Providing Integrated preschool Programs

The EB method has been used to identify costs for integrated preschool programs in three recent studies. The first was the major study Picus Odden & Associates conducted for The Fund for Child Development, which developed estimated costs for providing such programs, using various assumptions of eligibility and participation, in all states in the country (Picus, Odden & Goetz, 2009). The second was a study conducted in 2011 as part of an adequacy study for Texas (Picus, Odden, Goetz & Aportela, 2012). The third was an analysis conducted for Maine as part of a 2013 recalibration of its adequacy-oriented school funding system (Picus et al., 2013).

In these three studies, the EB Model was used to develop a per preschool pupil cost for a high quality preschool program by identifying the elements for a high quality preschool program. The per pupil cost figure was derived from a prototypical preschool program of 150 students, which included 10 classrooms of 15 students each, with the staffing and program elements identified in Table 4.1. It should be clear that these elements draw from the elements and ratios that the EB Model provides for regular elementary schools. The major difference is that for all preschool classes the EB Model provides one teacher position and one instructional aide position for every 15 preschool students.

The preschool EB Model provides core, elective and substitute teachers. Additional personnel resources include an assistant principal position to provide a preschool program coordinator, instructional coaches, pupil support, special education teachers for students with mild and moderate disabilities, instructional aides, special education aides, nurses and secretaries. Non-personnel resources are provided for technology and equipment, instructional materials, professional development, and assessments. The EB Model also includes central office costs for central administration and operation and maintenance.

Table 4.1 shows the resource levels and unit costs we used to estimate the per pupil costs of the EB Model for Wyoming. It uses the previous year's state average for operations and maintenance costs and for central office costs. The estimated cost for a preschool program is $14,271 per pupil.

Table 4.1: Elements for an Evidence-Based Prototypical preschool Program

Preschool Prototype (150 Pupils Per school)			
Personnel Resources	**Resources**	**Unit Cost**	**Total Cost**
Core Teachers	10.00	$80,348	$803,480
Electives (% of Core Teachers)	2.00	$80,348	$160,696
Instructional Facilitators	0.78	$80,348	$62,772
Special Education Teachers	1.00	$80,348	$80,348
Special Education Aides	1.00	$39,625	$39,625
PreK Instructional Aides	10.00	$39,625	$396,250
Nurses	0.20	$80,348	$16,070
Assistant Principals	1.00	$106,514	$106,514
School Secretary	1.00	$57,842	$57,842
Substitute Teachers (days)	137.81	$111	$15,275
Non-Personnel Resources			
Professional Development	150	$125	$18,750
Instructional Materials	150	$190	$28,500
Formative Assessments	150	$25	$3,750
Technology/Equipment	150	$250	$37,500
School Costs			**$1,827,372**
School Per Pupil Costs			*$12,182*
M&O Per Pupil Costs			*$1,081*
Central Office Per Pupil			*$1,008*
Preschool Per Pupil Cost			**$14,271**

Source: Authors' calculations.

Alternatively, the State could provide a preschool program as part of the EB Model and could simply add preschool student counts to those of every elementary school. By doing this and then staffing the preschool grades with one teacher and one instructional aide for every 15 preschool students, an estimate of the costs of providing preschool would be included in the costs of the EB Model.

Estimating the Costs of Preschool Programs in Wyoming

The WDE surveyed Wyoming school districts for the 2015 recalibration and results showed 15 of the 48 school districts are operating preschool programs. The programs are generally provided at one site in the district, but three districts had two sites with preschool programs, and one district had three sites with preschool programs.

Funding was quite varied. Several of the districts used portions of the Legislative Model to fund the preschool program; the percentage of the preschool budget deriving from the Legislative Model ranged from zero to 100%, even though the Legislative Model does not specifically include any funds for preschool. It seems that only one district used federal Head Start funds for its preschool program. Several districts used a variety of other federal funding resources, including Title 1, special education and Impact Aid. A few of the programs were supported by state funds, including Bridges Program funding. The survey was unable to provide a total amount of current funding for preschool programs.

This illustrates there are multiple funding sources available for the purposes of preschool. What is not available is a comprehensive accounting all of the State and federal funds provided or available to school districts and providers for preschool programs. In addition, a comprehensive assessment of the programs administered and populations served is necessary to determine the financial impact of a statewide comprehensive preschool program. This funding could possibly reduce the figures in Table 4.2 that estimate the costs of a statewide preschool program in Wyoming and its possible some of the educational interventions discussed below are being provided.

To estimate the costs of Wyoming's preschool program we used the estimated number of three- and four-year olds in 2014. There are approximately 7,600 three-year olds and 7,800 four-year olds. For our estimates, we assumed approximately 7,500 three and four-year olds would enroll in the preschool program.

Table 4.2 shows the estimated cost of a preschool program in Wyoming using these pupil counts. The cost is for a full-day program. All estimates would be halved for half-day programs. Nevertheless, the cost is substantial. To provide a full-day preschool program for children aged three and four, it would cost approximately over $214 million. The cost is halved to $107 million on the assumption that only four-year olds are served. If 60% of the 7,500 children participated – a reasonable assumption if preschool is not required – the cost for three and four-year olds would be $128.4 million or about half that amount for four-year olds only.

Table 4.2: Costs of a Wyoming Preschool Program

Scenario	Cost Assuming 100 % Participation (millions)	Cost Assuming 60 % Participation (millions)
Number of Children Age 3 (7,500)	$107	$64.2
Number of Children Age 4 (7,500)	$107	$64.2
Number of Children Age 3 and 4 (15,000)	$214	$128.4

Source: Authors' calculations.

While the cost of a preschool program may appear high, findings from longitudinal studies suggest that Wyoming could experience from a four- to ten-fold return on an investment in preschool programming. High quality, comprehensive preschool programs boost student learning in all levels of school, and improve career opportunities and earnings substantially. On a benefit-cost ratio, high quality, comprehensive preschool programs are solid investments, not only in Wyoming's future children, but also for the future Wyoming economy.

SCHOOL SAFETY AND SCHOOL RESOURCE OFFICERS

The EB Model and the Legislative Model do not address school safety and security through the use of SROs. This issue, however, was raised at the Select Committee's meeting on May 21 & 22, 2015 and we were asked to analyze the issue and provide cost estimates for a SRO program. This analysis addresses the need for school safety and includes:

- Research on the need for school district security operations;
- Staffing of school district security operations;
- The professional development needs of school districts for training SROs or other safety and security staff;
- The implementation and ongoing financial support for security services; and
- Options on how security funding might be provided to school districts should the Legislature decide to fund school this program.

Evidence and Analysis

Optimal standards for staffing a SRO program are not widely established in the educational community, and where they do exist, they are typically driven by local decisions and local funding. Given the relatively recent development and continued modification of school-based policing, there is minimal research to specifically tie a SRO program to improved student learning.

A comprehensive school safety and security program is multi-faceted and includes student intervention and counseling. For proper implementation, the program should cover three main areas 1) intervention, 2) training, and 3) facilities. This analysis addresses the first two aspects, but does not address facility improvements as they are largely covered through Wyoming's school capital construction program.

To research this element, we engaged the same team of consultants used to assist in determining the appropriate funding levels for student activities in Wyoming. Bill Sutter was the consultant primarily responsible for assisting us on SROs and school safety.

We reviewed a WASBO survey on school security, the WDE's school district survey on recalibration issues, the WASBO white paper *School Resource Officers and School Security*, and a number of other documents related to the issue of school safety.

This report narrows the focus from all forms of school safety addressed by the schools, which include situational student safety (e.g. driver's education and student sexual health), as well as hazardous materials, air quality, building maintenance, playground equipment condition, alarm systems and testing, and focuses on security issues related to the specific support provided by a SRO program and a robust system for an individual to anonymously report any threatening behavior that endangers a student, friends, families or communities. The intent is not to diminish the need for schools to continue support all areas of school and student safety, but to focus this analysis on the roles of SROs as the Select Committee directed.

Research

The implementation of a uniform and comprehensive statewide school safety and security program is a policy decision with the intent of improving student safety. Research shows student achievement suffers when students feel unsafe at school; they do not perform as well academically as students who feel safe at school (California Safe Schools Coalition, ND; Lacoe, 2012). Research also shows physical evidence of security (metal detectors) are not as effective as a school climate when it comes to improving student achievement (Kupchik & Ward, ND). Academic outcomes are improved with better student-adult relationships as evidenced by more adults being visible and talking to students in the hallways (Gronna, Chin-Chance and Selvin, 1999). The occurrences of school violence in Wyoming, as evidenced by the data in Table 4.3, have trended either just above, or just below national averages. Contiguous states have followed a similar trend. However, as of the 2013 reporting year, the reported incidences in Wyoming exceed those of contiguous states.

Table 4.3 Percentage of public school students in grades 9–12 who reported being threatened or injured with a weapon on school property at least one time during the previous 12 months, by state: Selected years, 2003 through 2013

State	Percentage of Students (%)					
	2003	2005	2007	2009	2011	2013
United States	9.2	7.9	7.8	7.7	7.4	6.9
Colorado	—	7.6	—	8.0	6.7	—
Idaho	9.4	8.3	10.2	7.9	7.3	5.8
Montana	7.1	8.0	7.0	7.4	7.5	6.3
Nebraska	8.8	9.7	—	—	6.4	6.4
South Dakota	6.5	8.1	5.9	6.8	6.1	5.0
Utah	7.3	9.8	11.4	7.7	7.0	5.5
Wyoming	**9.7**	**7.8**	**8.3**	**9.4**	**7.3**	**6.8**

Source: Youth Risk Behavior Survey Results, 2013

Additional evidence of the need for school safety and security can be found in the 2013 version of the biennial Youth Risk Behavior Survey (2013). Table 4.4 provides a summary of middle and high school responses to selected questions about school safety.

Table 4.4 Percent of Students Indicating an Affirmative Response to Selected Questions about School Safety from the Youth Risk Behavior Survey, 2013

Question	Percent of Students (%)	
	Middle School	High School
Being bullied on school property	56.1%	23.3%
Ever carried a weapon	48.7%	N/A
Carried a weapon in prior 30 days	N/A	28.8%
Carried a weapon on school property in prior 30 days	N/A	9.9%
Did not attend school because of feeling unsafe	N/A	7.8%
Seriously thought about suicide	24.5%	16.7%

Note: These data are from a National Sample
Source: Youth Risk Behavior Survey Results, 2013

In addition to these national findings about school safety, there has been considerable discussion of school safety and SROs in Wyoming. The Wyoming School Safety and Advisory Committee Report presented to the Wyoming Joint Education Interim Committee on December 1, 2014 contains detailed information on recent legislation in Wyoming related to school safety and security, as well as recommendations for implementation of programs and procedures. One main area of the recommendations was that there be a “shared funding” for those districts without a SRO program. Shared funding consists of having a school district and the city or county where it is located share the cost of a SRO. This is advantageous to both jurisdictions as the school district only pays for services when needed, while the city or county is able to provide additional safety officers at other times and for other needs. Moreover, municipalities with police or sheriff officers already has appropriate insurance and training programs for the officers, making it much less expensive than if a school district were to try to establish its own safety officers. Further details can be found within the 2013 School Safety and Security Task Force Report survey data (WDE, 2013). The issue of school safety and security continues to be an area of interest for the Joint Interim Education Committee and is on the list of study topics to be performed over the 2015 interim.

SROs in Wyoming

Currently, there are 54 SROs in Wyoming schools in 28 districts. This number represents only 58% of the 48 school districts. The Governor’s School Safety and Security Task Force conducted surveys and analysis as background for its report. A recurring observation from the education and public safety communities responding to these surveys was their recognition of the value added by a SRO. Ninety-eight percent (98%) of school districts expressed a desire to have SROs in their schools, and of those districts, 59% were willing to participate in cost sharing to hire them.

A considerable amount of work has been done to understand the current needs for and use of SROs in Wyoming school districts. There were several questions regarding SROs in the WDE’s 2015 recalibration, and WASBO has both conducted its own survey and produced a white paper with a number of recommendations about funding SROs and other school safety in the future.

A total of 38 of the 48 school districts responded to the WDE’s recalibration survey. The survey results showed:

- Of the 38 districts, 25 indicated they use SROs while 13 indicated they do not use them.
- One district utilized a half time SRO, 13 districts have one SRO, eight districts have two SROs, one district has three and two districts utilize more than 3 SROs in their schools.
- The number of SROS utilized by a district ranged from half a position to a total of eight SROs serving its schools.
- Among the 25 districts, 21 use SROs at all three school levels (elementary, middle and high School), while four use SROs only at the middle and high schools.
- Sixteen districts share or split funding for SROs with their local city or county, eight reported that the SRO positions are funded entirely by the district and one indicated it contracted for SRO services.
- For the districts that shared costs with the local city or county, there was a wide range of approaches to cost sharing. In general, districts paid for some portion of SRO time (generally 50 to 75%), but only when school is in session. When schools are not in session, local law enforcement agencies can use the SROs as police or fire officers.
- In addition to paying for staff time, school districts indicated they also fund some of the following cost items:
    - Phones
    - Training
    - Travel
    - Health insurance and benefits
    - Space

- Security cameras
- Computers
- Clerical support
- Supplies for program

The WASBO survey and white paper provided additional information related to potential funding mechanisms and levels of funding. A total of 30 districts responded to the WASBO survey and all 30 indicated funding should be available for SROs in Wyoming. When asked if cost-sharing partnerships should be encouraged, 29 answered affirmatively. Most respondents to the WASBO survey felt that funding for SROs should be included in the Legislative Model's block grant while 10 districts felt a categorical grant program would be better. One suggested funding police departments directly.

The WASBO white paper offered a number of suggestions regarding funding of SROs and school security services. Most of these are discussed below in our recommendation for funding these positions if the Legislature decides such funding is appropriate.

Overall, it is clear that school districts both feel they need SROs and school security services, and spend some of their block grant funds on such services even though the Legislative Model does not provide funding for these services.

Determining a Funding Mechanism for SROs

The decision to provide SRO and safety funding is a Legislative decision. If the Legislature wants to consider providing school districts with funding for SROs, it needs to determine the best approach for doing so and the appropriate level of funding. Establishing a funding mechanism is complicated because needs vary considerably, and many districts already have invested in SRO programs.

An example of the challenges in developing a funding mechanism is depicted in Table 4.5, which provides data on the variation across the Wyoming's counties on factors likely to impact the needs for SROs and their costs.

Table 4.5 Variation in Wyoming County Characteristics Likely to Impact the Need For and Cost of SROs

County Characteristic	Total	Minimum	Maximum	Average
County Area Sq. Mi.	97,105	2,004	10,426	4,222
Students	93,303	617	14,748	4,057
Population*	576,412	2,456	94,483	25,061.4
Population per Square Mile*		0.94	35.18	5.94
Students Per Square Mile		0.31	5.49	0.96
Median Income**		$38,438	$79,488	$57,406
School Districts in County	48	1	8	2.1
Schools in County	352	3	41	15.3

Sources:
*"Annual Estimates of the Resident Population for Counties of Wyoming: April 1, 2010 to July 1, 2011" (CSV). 2011 Population Estimates. United States Census Bureau, Population Division. April 2012. Retrieved April 18, 2012.
**Source: U.S. Census Bureau, 2009-2013 5-Year American Community.

Because of the wide variation in the characteristics of Wyoming school districts, it is difficult to establish a state level funding formula that will meet every need. In addition, placing funding for SROs into the block grant may lead to some districts electing to use these resources for alternative programs. Therefore, if the Legislature establishes a school safety and security program to be paid for with state resources, we recommend establishing a categorical program for funding SROs that reimburses districts for costs incurred based on a standard, statewide, set of resource and price guidelines.

The categorical grants could be provided to school districts to use for contracting with local policing agencies, or they could be provided directly to the local jurisdiction that provides the SROs to the school district. We recommend a categorical program as the policy decision around safety and security should flexible at the local level, but resources must be invested as intended. The recommendation is designed to allocate the specific resources, that when applied within a consistent framework, will provide a flexible program that is implemented with fidelity.

Districts or other local agencies that elect to use SRO positions would be subject to a set of funding guidelines and funded based on those guidelines.

The WASBO white paper provides one possible example of how a funding mechanism could be designed. The white paper states, “The needs and options for solutions to security issues can vary significantly from district to district. School location, facility design, social issues, and district size are factors that need to be considered and addressed in security solutions.”

WASBO proposes the following funding formula for SROs and school security:

1. SROs
    a. One SRO for every 1,000 ADM in districts with 1,000 or more ADM.
    b. Between 1,000 and 300 ADM, prorate the one FTE position down from 1.0 at 1,000 to 0.5 FTE at 300 students.
    c. A minimum of a half time (0.5 FTE) SRO for districts with fewer than 300 ADM.
2. Other Security Costs -- $7.00 per ADM.

Our research suggests these resource levels are likely higher than necessary. The unique nature of Wyoming with regard to land mass and population density (scarcity) poses a number of challenges for comparing SRO needs to other state or district models.

The Bureau of Justice Statistics (BJS), within the Office of Justice Programs, within the United States Department of Justice publishes Local Police Departments report every three to four years. This report contains excellent and highly reliable data on state and local police personnel throughout the United States. One aspect of this report is the average ratio of full time officers per 1,000 residents by size of population served. The most recent BJS data on this topic is from 2003 (Hickman & Reaves, 2006) and is displayed in Table 4.6. Although more recent data are not available the pattern has not changed significantly (Hickman & Reaves, 2015). What is interesting to note is that the number of officers per 1,000 residents appears to be ‘U’ shaped, that is in the least populated regions of the country there is some minimum number of officers that are needed to ensure full time (24/7) protection.

Table 4.6 FTE Law Enforcement Officers per 1,000 Residents, 2003

Population Served	FTE Officers Per 1,000 Residents
250,000 or more	2.5
100,000 to 249,999	1.9
50,000 to 99,999	1.8
25,000 to 24,000	1.8
10,000 to 24,999	2.0
2,500 to 9,999	2.2

Source: Hickman and Reaves, 2015

It is important to note that law enforcement is a 24/7 enterprise, whereas schools only need SROs for six to eight hours a day, approximately 180 days a year. Moreover, the local police staffing ratio should already take into account the student population and should be available if needed at schools during school hours when children are located at the schools.

An alternative staffing arrangement that would adequately meet the security needs of schools is one SRO per school district plus additional support for larger districts. That covers two areas - small districts in a large geographical area and better ability to coordinate between districts. NCES data suggest nationally there is approximately one full time SRO per 2,600 students. Applying the national average to the approximately 95,000 Wyoming students, it would generate between 35 and 36 SROs statewide.

A critical issue is cost sharing. Schools need SROs at most eight hours a day 175 days a year (the number of required student teacher contact days), which equates to 16% of the 24 hours 365 days a year law enforcement officers need to be available. The WASBO white paper suggests that the cost for each SRO be estimated at $75,000 per FTE to cover compensation (salary and benefits) of the SROs and that other costs be covered by the law enforcement agency. This figure seems somewhat high if SRO services are only contracted for during the time school is in session. Moreover, we estimate, with the assistance of our consultants, the compensation of an SRO at $65,000 annually. If districts were responsible for 16 to 20% of these costs on average, that would amount to between $10,400 and $13,000 a year per SRO which would compensate the local police agency for the share of total time allocated to the schools. However, police services are provided on a variable number of working individuals throughout the day. The daytime demands on police departments, which is the same time as schools are in session might make a figure of 33% more realistic to cover the school specific costs a police department faces (potentially mitigated by the fact that the police have also allocated resources per resident that include school age children). If a figure of 33% were used, the estimated cost per SRO for schools would be about $22,200.

WASBO also suggested $7.00 per ADM for specialized equipment (vehicles, firearms, training, etc.). This figure seems high in light of the fact that many security items are funded through school construction and major maintenance funding. Many other items are already part of an officer's equipment that should be the cost sharing with the town. Especially since those items could be used for "regular" law enforcement activity when school is not in session. When combined with CRERW report findings that central office non-personnel resources are not fully expended, it is logical that a portion of the costs associated with the $7.00 request could be covered by the resources generated by this element. We recommend that additional funding is not necessary for school security.

We recommend a slow roll-out of SRO services including ample time for training and evaluation of services. In addition, we support creation of a comprehensive school safety program, including a revised statewide security tip line, similar to the program under consideration by the Joint Interim Education Committee as presented at its June meeting. These programs are more preventative in nature and address school climate, as opposed to focusing solely on interventions after a tragedy occurs. Over time, the additional costs of SROs could be funded through categorical grants to districts as they implement safety programs. The grants would be tied to fixed FTE costs for SROs along with standards for cost sharing with local police agencies.

If it is determined that the Legislature would like to fund SROs in a definitive and finite manner with State resources, the EB recommendation is a categorical program that would provide resources to school districts only if they provide the intended security functions. We would also encourage the grant program to expect all districts find ways to share the costs of SROs with local law enforcement agencies, and to only pay for the SROs' work time when school is in session, by way of example, for 175 days a year.

But at this point we would recommend that the state cautiously wait until moving on a strategy to cost share SROs in school districts. This function actually is a function of the local policy and sheriff departments, and should be provided and funded largely by those agencies.

FUNDING DISTANCE EDUCATION

In response to 2015 House Enrolled Act No. 101, the WDE provided the Legislature with a report on distance education. The Task Force that prepared the report suggested distance education be provided as a part time program (students enrolled less than 50% of their courses in distance programs) or a full time program (more than 50% of enrollment in distance education). The Task Force suggests students enrolled in full time programs be considered students in the district providing the distance education and argues that there is no additional funding requirement for these students. For students in part time programs, the report recommends "the Legislature provide guidance on the development of course fees between districts."

Our view is that each district providing distance-learning courses available to other Wyoming district students set their own fees for the courses. The Task Force's report provides a comprehensive description of a centralized online course catalog. If each district were to include the cost per pupil for that course in the catalog, sending districts would know the cost of enrolling their students in those programs. Since the student is enrolled in the sending district, resources for that student are provided through the Legislative Model and no additional funding is needed.

Glossary of Funding Model Elements

Model Element	Definition
Core Teachers	Core teachers are the grade-level classroom teachers in elementary schools and the core subject teachers in middle and high schools (e.g., mathematics, science, language arts, social studies and world languages, including such subjects taught as Advanced Placement in high schools).
Elective Teachers	Elective teachers are teachers for subject areas not included in the core, including such classes as art, music, physical education, health, and career and technical education. However, some career technical education classes can substitute for core math and science classes.
Instructional Coaches/Facilitators	Instructional coaches/facilitators, sometimes called mentors, site coaches, curriculum specialists, or lead teachers, coordinate the school-based instructional program, provide the critical ongoing instructional coaching and mentoring that the professional development literature shows is necessary for teachers to improve their instructional practice, do model lessons, and work with teachers in collaborative teams using data to improve instruction.
Tutors	Tutors, or Tier 2 Interventionists, are licensed teachers who, during the regular school day, provide one to one or small group (no larger than 5) tutoring to students struggling to meet proficiency in core subjects.
Extended-Day Programs	Extended-day programs provide academic extra help to students outside the regular school day before and after school.
Summer School	Summer school includes all programs provided during the summer months, i.e., outside the regular school year, largely focusing on academic deficiencies of students but includes a wider array of classes for high school students
At-risk Students	The unduplicated count of students eligible for free and reduced price lunch, ELL and mobile students as defined by Wyoming Department of Education rules and regulations.
English Language Learner (ELL) Students	ELL students are those who come from homes where English is not the native language and is further defined by Wyoming Department of Education rules and regulations.
Special Education	Programs for all students with disabilities.
Alternative Schools	Alternative Schools provide services, usually outside of the regular school environment, to students who have some combination of significant behavioral, social and emotional issues, often including alcohol or drug addictions. These students are different from at-risk students and require a different set of services.
Gifted, Talented	Gifted and talented students are those who perform in the very top levels of performance, and can handle much more than a year of academic work in a regular school year.
Substitute Teachers	These are regular substitute teachers.
Pupil Support, Guidance Counselors, Nurses	These include guidance counselors, social workers, psychologists, family outreach workers, nurses, etc.
Supervisory Aides	These are non-licensed individuals who monitor the hallways, doors and playgrounds, and supervise the lunchroom.
Librarians	These are regular school librarians.
Principal, Assistant Principal	These are regular school principals and assistant principals which are the administrators of the school.
Professional Development	Professional development includes all training programs for licensed staff in schools including professional development for implementing new curriculum

Model Element	Definition
	programs, sheltered English instructional strategies for ELL students, gifted and talented, etc. It also includes assistance to teachers working in collaborative groups and ongoing coaching of teachers in their individual classrooms.
School-Based Technology and Equipment	Computers, servers, network equipment, copiers, printers, instructional software, security software, some curriculum management courseware, etc.
Instructional Materials	Textbooks, consumable workbooks, laboratory equipment, library books and other relevant instructional materials.
Interim-, Short-Cycle Assessments	Benchmark, progress monitoring, formative, diagnostic and other assessments teachers need in addition to state accountability assessment data.
Student Activities	This includes on-credit producing after-school programs, including clubs, bands, sports, and other such activities.
Central Office Administration	Superintendent, assistant superintendents, curriculum director, special education, the business and HR functions, assessment & technology, and a director of operations/maintenance.
Operations and Maintenance	Covers functions such as custodial services, grounds maintenance and facilities maintenance and minor repairs.

References

21st Century School Fund (2015). *Now and for the Future: Adequate and Equitable K-12 Facilities in Wyoming*. Washington, DC: 21st Century School Fund, JFW, Inc., June 17, 2015

Alexander, K.L. & Entwisle, D.R. (1996). Schools and children at risk. In A. Booth, and J.F. Dunn (Eds.). *Family-school links: How do they affect educational outcomes?* (pp.67-89). Mahwah, NJ: Lawrence Erlbaum Associates.

American Association of School Librarians (AASL). (December, 2014). Causality: School Libraries and Student Success. White Paper. American Library Association. Available at: http://www.ala.org/aasl/sites/ala.org.aasl/files/content/researchandstatistics/CLASSWhitePaperFINAL.pdf. Last Retrieved August 18, 2015.

Andrews, M., Duncombe, W. & Yinger, J. (2002). Revisiting economies of size in American education: Are we any closer to a consensus. *Economics of Education Review, 21*(3), 245-262.

APPA. (1998). *Custodial Staffing Guidelines for Educational Facilities (2nd Ed.).* Alexandria, VA: APPA.

APPA. (2001). *Operational Guidelines for Grounds Management*. Alexandria, VA: APPA National Recreation and Park Association, Professional Grounds Management Society.

APPA. (2002). *Maintenance Staffing Guidelines for Educational Facilities* . Alexandria, VA: APPA.

Archambault, F.X., Jr., Westberg, K.L., Brown, S., Hallmark, B.W., Zhang, W. & Emmons, C. (1993). Regular classroom practices with gifted students: Findings from the Classroom Practices Survey. *Journal for the Education of the Gifted, 16*, 103-119.

Aron, L. Y. (2006). *An Overview of Alternative Education*. Washington, DC: The Urban Institute. **http://www.urban.org/UploadedPDF/411283_alternative_education.pdf**

Ascher, C. (1988). Summer school, extended school year, and year-round schooling for disadvantaged students. *ERIC Clearinghouse on Urban Education Digest, 42,* 1-2.

Aud, S., Kewal Ramani, A. & Frohlich, L. (2012). *America's Youth: Transitions to Adulthood*. U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Barnett, W. S. (2007). *Benefits and Costs of Quality Early Childhood Education*. The Children's Legal Rights Journal, 27(10, 7-23.

Barnett, W. S. (2008). *Preschool Education and its Lasting Effects: Research and Policy Implications.* Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved June 2, 2015 from http://epicpolicy.org/publication/preschool-education

Barnett, W. S. (2010). Universal and targeted approaches to preschool education in the United States. *International Journal of Child Care and Education Policy, 4*(1), 1-12.

Barnett, W. S. (2011a). Effectiveness of early educational intervention. *Science, 333,* 975-978.

Barnett, W. S. (2011b). Four reasons the United States should offer every child a preschool education. In E. Zigler, W. Gilliam, & W. S. Barnett (Eds.), *The preschool debates: Current controversies and issues* (pp. 34-39). Baltimore: Brookes Publishing.

Barnett, W.S., Carolan, M.E., Squires, J.H., Clarke Brown, K., & Horowitz, M. (2015). *The state of 2014: State preschool yearbook*. New Brunswick, NJ: National Institute for Early Education Research.

Barnett, W.S., Hustedt, J.T., Friedman, A.H., Boyd, J.S. & Ainsworth, P. (2007). *The State of Preschool 2007*. New Brunswick, NJ: The National Institute for Early Education Research, Rutgers Graduate School of Education. Available at http://nieer.org/yearbook/.

Battaglino, T. B., Haldeman, M. & Laurans, L. (2012). *The costs of online learning.* Dayton, OH: Thomas Fordham Institute.

Black, P. &William, D. (1998). Inside the Black Box: Raising standards through classroom assessments. *Phi Delta Kappan*, 80(2), 139-148.

Blankstein, A. (2010). *Failure Is Not An Option, 2nd Edition*. Thousand Oaks: Corwin Press.

Blankstein, A. (2011). *The Answer is in the Room: How Effective Schools Scale Up Student Success*. Thousand Oaks: Corwin Press.

Bleske-Rechek, A., Lubinski, D & Benbow, C.P. (2004). Meeting the educational needs of special populations: Advanced Placement's role in developing exceptional human capital. *Psychological Science*, *15*(4), 217-224.

Bogard, K. (2003). *Mapping the P-3 Continuum (MAP): P-3 as the Foundation of Education Reform*. New York, NY: Foundation for Child Development. September, 2003.

Borman, G.D. (2001). Summers are for learning. *Principal, 80*(3), 26-29.

Borman, G.D. & Boulay, M. Eds. (2004). *Summer learning: Research, policies and programs*. Mahwah, NJ: Lawrence Erlbaum Associates.

*Borman, G. D. & Dowling, M. (2006). The longitudinal achievement effects of multi-year summer school: Evidence from the Teach Baltimore randomized field trial. *Educational Evaluation and Policy Analysis, 28,* 25–48.

*Borman, G., Goetz, M. & Dowling, M. (2009). Halting the summer achievement slide: A randomized evaluation of the *KindergARTen* Summer Camp. *Journal of Education for Students Placed At Risk, 14*(2), 133-147.

Borman, G. D., Hewes, O.L. & Brown, S. (2003). Comprehensive school reform and achievement: A meta-analysis. *Review of Educational Research*, *73*(2), 125-230.

Borman, G., Rachuba, L., Hewes, G., Boulay, M. & Kaplan, J (2001). Can a summer intervention program using trained volunteer teachers narrow the achievement gap? First-year results from a multi-year study. *ERS Spectrum*, *19*(2), 19-30.

Boudett, K.P., City, E.A. & Murnane, R. (2007). *A Step-by-Step Guide to Using Assessment Results to Improve Teaching and Learning*. Cambridge: Harvard Education Press.

Brabeck, M.M., Walsh, M.E. & Latta, R. (2003). *Meeting at the hyphen: Schools-universities-communities-professions in collaboration for student achievement and well being*. *The One-hundred and second yearbook of the National Society for the Study of Education, Part II*. Chicago: National Society for the Study of Education.

Bransford, J., Brown, A. & Cocking, R. (1999). *How people learn*. Washington, DC: National Academy Press.

California Safe Schools Coalition, (ND). *School Safety and Academic Achievement*. San Francisco, CA: Safe Schools Research Brief 7. No Date

Camilli, G., Vargas, S., Ryan, S., & Barnett, W.S. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teachers College Record, 112*(3), 579-620.

Capizzano, J., Adelman, S. & Stagner, M. (2002). *What happens when the school year is over? The use and costs of child care for school-age children during the summer months*. (Assessing the New Federalism, Occasional Paper, No. 58). Washington, D.C.: Urban Institute.

*Carlson, D., Borman, G D. & Robinson, M. (2011). A multistate district-level cluster randomized trial of the impact of data-driven reform on reading and mathematics achievement. *Educational Evaluation and Policy Analysis, 33*(3), 378-398.

Carver, P.R & Lewis, L. (2010). *Alternative Schools and programs for Public School Students At Risk of Educational Failure: 2007-08* (NCES 2010-026). U.S. Department of Education, National Center for Education Statistics. Washington, DE: Government printing Office.

Chenoweth, K. (2007). *It's Being Done: Academic Success in Unexpected Schools* (Harvard Education Press

Chenoweth, K. (2009). *How It's Being Done: Urgent Lessons from Unexpected Schools* Harvard Education Press.

Clark, K. (2009). The case for structured English immersion. *Educational Leadership, 66*(7), 42–46.

Cohen, P., Kulik, J. & Kulik, C. (1982). Educational outcomes of tutoring: A meta-analysis of findings. *American Educational Research Journal, 19*(2), 237-248.

Conger, D. (2008). *Testing, Time Limits, and English Learners: Does Age of School Entry Affect How Quickly Students Can Learn English?* Paper presented at the 2008 Annual Meeting of the American Education Research Association, March.

*Cook, P., Dodge, K., Farkas, G., Fryer, R.G. Jr,, Guryan, J., Ludwig, J., Mayer, S. Pollack, H. & Steinberg, L. (2014). *The (surprising) efficacy of academic and behavioral intervention with disadvantaged youth: Results from a randomized experiment in Chicago. Working Paper 19862*. Cambridge, MA: National Bureau of Economic Research.

Cooper, H, Charlton, K., Valentine, J.C. & Muhlenbruck, L. (2000). Making the most of summer school: A meta-analytic and narrative review. *Monographs of the Society for Research in Child Development, 65* (1, Serial No. 260).

Cooper, H., Nye, B., Charlton, K., Lindsay, J. &Greathouse, S. (1996). The effects of summer vacation on achievement test scores: A narrative and meta-analytic review. *Review of Educational Research, 66*, 227-268.

Cooper, H, Batts-Allen, A, Patall, E A. &Dent, A L. (2010). Effects of full-day kindergarten on academic achievement and social development. *Review of Educational Research*, 80(1), 34-70.

Cornett, J. & Knight, J. (2008). Research on coaching. In J. Knight, Ed., *Coaching: Approaches and Perspectives (pp. 192-216).* Thousand Oaks, CA: Corwin.

Crow, T., (Ed.) (2011). Standards for professional learning. *Journal of Staff Development*, *32*(4), Special Issue.

Decotis, J. & Tanner, C. (1995). The effects of continuous-progress nongraded primary school programs on student performance and attitudes toward learning. *Journal of Research and Development in Education.* 28: 135-143.

Denton, K., West, J. &Walston, J. (2003). *Reading—Young children's achievement and classroom experiences: Findings from the Condition of Education 2003*. Washington, DC: National Center for Education Statistics.

Donovan, S. & J. Bransford. (2005a). *How students learn – history in the classroom*. Washington, DC: National Research Council.

Donovan, S. & J. Bransford. (2005b). *How students learn – mathematics in the classroom*. Washington, DC: National Research Council.

Donovan, S. & J. Bransford. (2005c). *How students learn – science in the classroom*. Washington, DC: National Research Council.

Donovan, S., and Cross, C. (2002). *Minority students in special and gifted education*. Washington, DC: National Academy Press.

DuFour, R., DuFour, R., Eaker, R. & Many, T. (2010). *Learning by doing: A handbook for professional communities at work*. Bloomington, IN: Solution Tree Press.

Duncombe, W. &Yinger, J. (2007). Does School District Consolidation Cut Costs? *Education Finance and Policy*, 2(4), 341-375.

Duncombe, W. D. &Yinger, J. M. (2010). School district consolidation: The benefits and costs. *The School Administrator*, *67*(5), 10-17.

Duncan, G. J. & Murnane, R.J. (2014). *Restoring Opportunity: The Crisis of Inequality and the Challenge for American Education*. Cambridge, MA: Harvard Education Press.

Earthman, G. (2002). *School Facility Conditions and Student Academic Achievement*. Blacksburg, VA: Virginia Polytechnic Institute, October 2002.

Educational Research Service. (2009). *Staffing patterns in public school systems: Current status and trends, update 2009*. Alexandria, VA: Educational Research Service, www.ers.org. Downloaded September 3, 2010.

Elbaum, B., Vaughn, S., Hughes, M.T. &Moody, S.W. (1999). Grouping practices and reading outcomes for students with disabilities. *Exceptional Children*, *65*, 399-415.

Elicker, J. & Mathur. S. (1997). What do they do all day? Comprehensive evaluation of a full day kindergarten. *Early Childhood research Quarterly*, 12(4), 459-480.

Farkas, G. (1998). Reading one-to-one: An intensive program serving a great many students while still achieving. In Jonathan Crane, (Ed.), *Social programs that work*. New York: Russell Sage Foundation.

Fashola, O. S. (1998). *Review of extended-day and after-school programs and their effectiveness* [Report No. 24]. Washington, DC: Center for Research on the Education of Students Placed at Risk (CRESPAR), Howard University.

Feldman, A.F. & Matjasko, J.L. (2005). The role of school-based extracurricular activities in adolescent development; A comprehensive review and future directions. *Review of Educational Research*, *7*5(2), 159-210.

Field, G. B. (2007). *The effect of using Renzulli Learning on student achievement: An investigation of internet technology on reading fluency and comprehension*. Storrs, CT: University of Connecticut, Neag School of Education, National Research Center on the Gifted and Talented.

Finn, J. (2002). Small classes in America: Research, practice, and politics. *Phi Delta Kappan*, *83*(7), 551-560.

*Finn, J.D. & Achilles, C.M. (1999). Tennessee's class size study: Findings, implications, misconceptions. *Educational Evaluation and Policy Analysis, 21*, 97-109.

*Finn, J. D., Gerber, S.B., Achilles, C. M. &Zaharias, J.B. (2001). The enduring effects of small classes. *Teachers College Record*, *103*(2), 145-183.

Florida Department of Education (2014). Maintenance and Operations Administrative Guidelines for School Districts and Community Colleges. Tallahassee, FL: Florida Department of Education, available at http://www.fldoe.org/edfacil/pdf/5_0.pdf. Last accessed October 29, 2014.

Fox, W. F. (1981). Reviewing economies of size in education. *Journal of Education Finance*, *6*(3), 273-296.

Frattura, E. and Capper, C. (2007). Leading for Social Justice: Transforming Schools for All Learners. Thousand Oaks, CA: Corwin Press.

Fredricks, J. & Eccles, J. (2006). Is Extracurricular Participation Associated With Beneficial Outcomes? Concurrent and Longitudinal Relations, *Developmental Psychology*, 42(4):698–713.Fusaro, J. A. (1997). The effect of full-day kindergarten on student achievement: A meta-analysis, *Child Study Journal*, *27*(4), 269-277.

Frede, E., Jung, K., Barnett, W.S., Lamy, C.E. &Figueras, A. (2007). *The Abbott Preschool Program Longitudinal Effects Study (APPLES): Interim Report*. New Brunswick, NJ: National Institute for Early Education Research. http://nieer.org/resources/research/APPLES.pdf. Last referenced on August 25, 2008.

Gallagher, J. (1996). The strange case of acceleration. In C. Benbow and D. Lubinski (Eds.), *Intellectual talent* (pp. 83-92). Baltimore: Johns Hopkins Press.

Gallagher, J. (2002). *Society's role in educating gifted students: The role of public policy* (RM02162). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Gallagher, J. &Coleman, M.R. (1992). *State policies on the identification of gifted students from special populations: Three states in profile*.

Gallagher, S. & Stepien, W. (1996). Content acquisition in problem-based learning: Depth versus breadth in American studies. *Journal for the Education of the Gifted*, *19*, 257-275.

Gallagher, S., Stepien, W. &Rosenthal, H. (1992). The effects of problem-based learning on problem solving. *Gifted Child Quarterly*, *36*, 195-200.

Gandara, P. & Rumberger, R. W. (2008). Defining an adequate education for English learners. Education Finance and Policy, 3(1), 130-148.

Gandara, P., Rumberger, R., Maxwell-Jolly, J. & Callahan, R. (2003). English learners in California schools: Unequal resources, unequal outcomes. Education Policy Analysis Archives, 11(3).

Garet, M.S., Porter, A., Desimone, L., Birman, B. &Yoon, K. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, *38*(4), 915-945.

Gault, B., Mitchell, A.W., Williams, E., Dey, J. & Sorokina, O. (2008). *Meaningful Investments in Preschool: Estimating the Per-Child Costs of Quality Programs.* Washington, DC: Institute for Women's policy Research. http://www.iwpr.org/pdf/G718preschoolnow.pdf. Last referenced on July 8, 2008.

*Gerber, S., Finn, J., Achilles, C. & Boyd-Zaharias, J. (2001). Teacher aides and students' academic achievement. *Educational Evaluation and Policy Analysis*, *23*(2), 123-143.

Gersten, R., Ed. (2006). Elementary School Journal. Entire Issue.

Goodwin, B. (February, 2011). Research Says… One-to-One Laptop Programs Are No Silver Bullet. *Educational Leadership*. 68(5)78-79. Association for Supervision and Curriculum Development ASCD. Available at: http://www.ascd.org/publications/educational_leadership/feb11/vol68/num05/One-to-One_Laptop_Programs_Are_No_Silver_Bullet.aspx

Gordon, E. E. (2009). 5 ways to improve tutoring programs. *Phi Delta Kappan*, 90(6), 440-445.

*Grissmer, D. (1999). Class size: Issues and new findings. *Educational Evaluation and Policy Analysis*, *21*(2). [Entire Issue].

Gromley, W.T. Jr. (2007). Early Childhood Care and Education: Lessons and Puzzles. *Journal of Policy Analysis and Management*. 26(3) 633-671.

Gromley, W.T. Jr., Gayer, T., Phillips,D. & Dawson, B. (2005). The Effects of Universal Preschool on Cognitive Development. *Developmental Psychology* 41(6), 872-884.

Gronna, S.S., Chin-Chance & Selvin, A. (1999). Effects of School Safety and School Characteristics on Grade 8 Achievement: A Multilevel Analysis. Paper Presented at the Annual Meeting of the American Education Research Association, Montreal, Quebec, Canada, April, 1999. ED 430 292

Gullo, D. (2000). The long-term effects of full-school-day kindergarten on student achievement: A meta-analysis. *Early Child Development and Care*, *160*(1), 17-24.

Gutierrez, R. & Slavin, R. (1992). Achievement Effects of the Nongraded Elementary School: A Best Evidence Synthesis. *Review of Educational Research*, 62(4), 333-376.

Hakuta, K. (2011). Educating language minority students and affirming their equal rights: Research and practical perspectives. *Educational Researcher, 40*(4), 163-174.

Hanover Research. (2013). *Review of K12 Literacy and Math Progress Monitoring Tools*. Washington, D.C.

Hansen, J. & Feldhusen, J.F. (1994). Comparison of trained and untrained teachers. *Gifted Child Quarterly*, *38*(3), 115-121.

Hanushek, E. (2002). Evidence, politics and the class size debate. In L. Mishel and R. Rothstein (Eds.), *The class size debate (pp. 37-65)*. Washington, DC: Economic Policy Institute.

Henry, G.T., Gordon, C.S. & Rickman, D.K. (2006). Early Education Policy Alternatives: Comparing Quality and Outcomes of Head Start and State Preschool. *Educational Evaluation and Policy Analysis*. 28(1), 77-99.

Hickman, M.J. & Reaves, B.A. *Local Policy Departments, 2003*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. May 2015, NCJ 248677. Available at http://www.bjs.gov/content/pub/pdf/lpd03.pdf last accessed 8-25-15.

Hoachlander, G., Klein, S. & Studier, C. (2007). *New Directions for High School Career and Technical Education in Wyoming: A Strategic Plan*. Berkeley, CA: MPR Associates. Indiana Department of Education. *Alternative Education Programs*. http://www.doe.in.gov/alted/altedlinkpg.html. Downloaded September 2010.

Jackson, L. (2009). One-to-One Computing: Lessons Learned, Pitfalls to Avoid. *Education World* [website]. Available at: http://www.educationworld.com/a_tech/tech/tech197.shtml. Last retrieved July 9, 2015.

Jacobson, L. (2003). State-financed Preschool shows positive effect, new research says. *Education Week*, November 19, 2003.

James-Berdumy, S., Dynarski, D. & Deke, J. (2005). *When Elementary Schools Stay Open Late: Results from The National Evaluation of the 21st Century Community Learning Centers Program.* Washington, D.C.: Mathematica Policy Research, Inc.

Jimenez-Castellanos, O. & Topper, A. M. (2012). The cost of providing an adequate education to English language learners: A review of the literature. *Review of Educational Research, 82*(2), 179-232.

Joyce, B. & Calhoun, E. (1996). *Learning experiences in school renewal: An exploration of five successful programs*. Eugene, OR: ERIC Clearinghouse on Educational Management.

Joyce, B. & Showers, B. (2002). *Student achievement through staff development (3rd Ed.).* Alexandria, VA: Association for Supervision and Curriculum Development.

Kalil, A. & Crosnoe, R. (2008). *Two Generations of Educational Progress in Latin American Immigrant Families in the U.S: A Conceptual Framework for a New Policy Context.* Mimeograph.

Karoly, L., Greenwood, P., Everingham, S., Hoube, J., Kilburn, M. R., Rydell, C. P., Sanders, M., & Chiesa, J. (1998). *Investing in our children: What we know and don't know about the costs and benefits of early childhood interventions*. Santa Monica, CA: The RAND Corporation.

Kataoka, S. & Vandell, D.L. (2013) Quality of Afterschool Activities and Relative Change in Adolescent Functioning Over Two Years, *Applied Developmental Science*, 17:3, 123-134, DOI: 10.1080/10888691.2013.804375

Kauerz, K. (2005). *Full day kindergarten: A study of state policies in the United States*. Denver, CO: Education Commission of the States.

Kauerz, K. (2006). Ladders of Learning: Fighting Fade-Out by Advancing K-3 Alignment. Washington, DC: New American Foundation, Issue Brief #2 (January).

Kim, J.S. & Quinn, D.M. (2013). The effects of summer reading on low-income children's literacy achievement from kindergarten to grade8: A meta-analysis of classroom and home interventions. *Review of Educational Research*, 83(3), 386-431.

Kirst, M. & Venezia, A., Eds (2004). *From High School to College - Improving Opportunities for Success in Postsecondary Education*. San Francisco: Jossey-Bass.

Klein, S., Hoachlander, G., Bugarín, R. & Medrichs, E. (2002). *Developing a Vocational Cost Adjustment to the Wyoming Education Resource Block Grant Model.* MPR Associates, Inc., Berkeley, CA.

Kleiner, B., Nolin, M.J. & Chapman, C. (2004). *Before and After School Care Programs, and activities through eighth grade: 2001*. Washington, D.C.: U.S. Department of Education, National Center for Education Statistics.

Konstantopoulos, S. & Chung, V. (2009). What are the long term effects of small classes on the achievement gap? Evidence from the lasting benefits study. *American Journal of Education, 116*(November), 125-154.

*Krueger, A. (2002). Understanding the magnitude and effect of class size on student achievement. In L. Mishel and R. Rothstein (Eds.), *The class size debate (pp. 7-35).* Washington, DC: Economic Policy Institute.

*Krueger, A. B. & Whitmore, D.M. (2001). *Would smaller classes help close the Black-White achievement gap? (*Working paper #451). Princeton, NJ: Princeton University. [On-line]. Available: http://www.irs.princeton.edu/pubs/pdfs/451.pdf.

Kulik, J.A. & Kulik, C.C. (1984). The effects of accelerated instruction. *Review of Educational Research, 54*(3), 409-425.

Kulik, J. & Kulik C.C. (1992). Meta-analytic findings on grouping programs. *Gifted Child Quarterly, 36*(2), 73-77.

Kupchik, A. & Ward, G.K. (ND). *Reproducing Social Inequality through School Security: Effects of Race and Class on School Security Measures*. Irvine, CA: University of California at Irvine, unpublished manuscript.

Lacoe, J.R. (2012). *To Scared to Learn? The Academic Consequences of Feeling Unsafe at School*. New York, NY: Robert F. Wagner Graduate School of Public Service, NYU.

Lance, K. C. & Hofschire, L. (2012). *Change in school librarian staffing linked to change in CSAP reading performance, 2005 to 2011*. Denver, CO: Library Research Service.

Lee, V. &Smith, J. (1997). High school size: Which works best, and for whom? *Educational Evaluation and Policy Analysis, 19*(3), 205-228.

Lee, V.E., Burkam, D.T., Ready, D.D., Honigman, J. & Meisels, S.J. (2006). Full-day versus half-day kindergarten: In which program do children learn more? *American Journal of Education*, 11(2), 163-208.

Levenson, N. (2011). *Something has got to change: Rethinking special education, Working Paper 2011-01*. Washington, D.C.: American Enterprise Institute.

Levenson, N. (2012). *Boosting the quality and efficiency of special education*. Dayton, OH: Thomas Fordham Institute.

Lockwood, J.R., McCombs, J.S. &Marsh, J. (2010). Linking reading coaches and student achievement: Evidence from Florida middle schools. *Educational Evaluation and Policy Analysis, 32*(3), 372–388.

Lynch, R.G. (2007). *Enriching Children, Enriching the Nation: Public Investment in High-Quality Preschool*. Washington, DC: Economic Policy Institute.

Lyon, G. R., Fletcher, J. M., Shaywitz, S. E., Shaywitz, B. A., Torgesen, J. K., Wood, F. B., et al. (2001). *Rethinking Learning Disabilities*. Washington, DC: Thomas Fordham Foundation. URL: http://www.edexcellence.net/library/special_ed/index.html

Madden, N. A., Slavin, R., Karweit, N., Dolan, L. J. &Wasik, B. A. (1993). Success for all: Longitudinal effects of a restructuring program for inner-city elementary schools, *American Educational Research Journal*, 30: 123–148.

Marsh, J. A., McCombs, J.S. & Martorell, F. (2010). How instructional coaches support data-driven decision making. *Educational Policy*, ***24***(6), 872–907.

*May, H., Gray, A., Gillespie, J., Sirindes, P., Sam, C. Goldsworth, H., Armijo, M. & Tognatta, N. (2013). *Evaluation of the i3 Scale-up of Reading Recovery*. Philadelphia: University of Pennsylvania. Downloaded July 2014 at http://www.cpre.org/sites/default/files/researchreport/1488_readingrecoveryreport.pd

McCombs, J. S., Augustine, C. H., Schwartz, H. L., Bodilly, S. J., McInnis, B., Lichter, D. A. & Cross, A. B. (2011). *Making Summer Count: How Summer Programs Can Boost Children's Learning*. Santa Monica, CA: RAND Corporation. Retrieved December 3, 2013, from, http://www.rand.org/pubs/monographs/MG1120.htm

Mellard, D. (2004). *Understanding Responsiveness to Intervention in Learning Disabilities Determination*. Lawrence, Kansas: National Research Center on Learning Disabilities. Retrieved January 17, 2007 at: http://nrcld.org/publications/papers/mellard.pdf

Michie, J., and Holton, B. (2005). *Fifty years of supporting children's learning: A history of public school libraries and federal legislation from 1953 to 2000* (NCES 2005-311). U.S. Department of Education. National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Miller, S. D. (2003). Partners in Reading: Using classroom assistants to provide tutorial assistance to struggling first-grade readers. *Journal of Education for Students Placed At Risk, 8*(3), 333-349.

Mishel, L. and Rothstein, R. (Eds.). (2002). *The class size debate*. Washington, DC: Economic Policy Institute.

Monk, D. (1990). *Educational finance: An economic approach*. New York: McGraw-Hill.

*Mosteller, F. (1995). The Tennessee study of class size in the early school grades. *The Future of Children: Critical Issues for Children and Youths, 5*, 113-127.

Mutter, D. and Randolph, J. (1987). A Step-By-Step Plan for an Inhouse Maintenance Audit of School Buildings, *Educational Facility Planner*, (25)4, July-August.

National Center for Educational Statistics. (2013) *Characteristics of Public Elementary and Secondary School Library Media Centers in the United State: Results from the 2011-12 Schools and Staffing Survey*. Washington, DC. Available at: http://nces.ed.gov/pubs2013/2013315.pdf (last accessed August 22, 2014).

National Center for Education Statistics (NCES). (2015). Table 701.20 : Selected Statistics on Public School Libraries/Media Centers. *Digest of Education Statistics – 2013.* NCES 2015-11:791. Available at: http://nces.ed.gov/pubs2015/2015011.pdf . Last retrieved August 16, 2015.

National Education Commission on Time and Learning. (1994). *Prisoners of time.* Washington, DC: Author.

Nelli, R. (2006, May). *Operations and maintenance adequacy in California public schools: An evidence-based approach*. Dissertation. Los Angeles, CA: Rossier School of Education, University of Southern California.

NFHS Handbook 2013-14. *National Federation of State High School Associations, 2013*. Web. 15 July 2015. <http://old.nfhs.org/content.aspx?id=6123>.

*Nye, B. A., L. V. Hedges, &S. Konstantopulos. (2001a). The long-term effects of small classes in early grades: Lasting benefits in mathematics achievement at grade nine. *Journal of Experimental Education*, *69*(3), 245-258.

*Nye, B. A., L. V. Hedges & S. Konstantopoulos. (2001b). Are effects of small classes cumulative: Evidence from a Tennessee experiment, *Journal of Educational Research*, *94*(6), 336-345.

*Nye, B., Hedges, L.V. & Konstantopoulos, S. (2002). Do low-achieving students benefit more from small classes? Evidence from the Tennessee class size experiment. *Educational Evaluation and Policy Analysis 24*(3), 201-217.

Odden, A. (1997). How to rethink school budgets to support school transformation. *Getting better by design series*, *Volume 3.* Arlington, VA: New American Schools.

Odden, A. (2009). *Ten strategies for doubling student performance*. Thousand Oaks, CA: Corwin Press.

Odden A. (2011a). *Strategic management of human capital in education*. New York: Routledge Press

Odden, A. (2011b). The dollars and sense of comprehensive professional learning. *Journal of Staff Development*, 32(4), 26-32.

Odden, A. (2012). *Improving student learning when budgets are tight*. Thousand Oaks, CA: Corwin Press.

Odden, A. and Archibald, S. (2009). *Doubling Student Performance and Finding the Resources to Do It.* Thousand Oaks, CA: Corwin Press.

Odden, A., and Picus, L. O. (2014). *School Finance: A Policy Perspective, 5th edition*. New York: McGraw-Hill.

Pavan, B.. (1992). Recent research on nongraded schools: The benefits of nongraded Schools. *Educational Leadership*, 50(2), 22-25.

Phelps, L. Allen. (2006). *Career and technical education in Wisconsin's new economy: Challenges and investment imperatives*. Madison: University of Wisconsin, Wisconsin Center for Education Research, Consortium for Policy Research in Education**.**

*Pianta, R., Allen, J. &King, H. (2011). An interaction-based approach to enhancing secondary school instruction and student achievement, *Science*, 333 (6045), 1034-1037.

Pianta, R., Barnett, W. S., Justice, L. & Sheridan, S. (Eds.) (2012). *Handbook of early childhood education*. New York, NY: Guilford Publications.

Picus, L.O., Marion, S., Calvo, N. & Glenn, W. (2005). Understanding the Relationship between Student Achievement and the Quality of Educational Facilities: Evidence from Wyoming. *Peabody Journal of Education*. 80(3), 71-95.

Picus, L. O. & Odden, A. (2010). *2010 Cost of Education Study: Submitted to the Select School Finance Committee of the Wyoming State Legislature*. Los Angeles, CA: Lawrence O. Picus and Associates. Available at: http://www.lpicus.com

Picus, L. O., Odden, A., Goetz, M. &Aportela, A. (2012). *Estimating the cost of an adequate education for Texas school districts using the evidence-based approach.* North Hollywood, CA. SED Lawrence O. Picus and Associates.

Picus, L. O., Odden, A., Glenn, W., Griffith, M. & Wolkoff. M. (2011). *An Evaluation of Vermont's Education Finance System.* North Hollywood, CA: Picus Odden and Associates. Available at http://picusodden.com/wp-content/uploads/2013/09/VT_Finance_Study_1-18-2012.pdf.

Picus, L. O., Odden, A., Goetz, M., Aportela A. & Griffith, M. (2013). *An Independent Review of Maine's Essential Programs and Services Funding Act, Parts 1 and 2*. North Hollywood, CA: Picus Odden and Associates. Available at http://picusodden.com/wp-content/uploads/2013/09/Review_of_Maines_Essential_Programs_and_Services_Program_-_Part_1.pdf and http://picusodden.com/wp-content/uploads/2013/08/Picus-and-Assoc.-Part-2-Final-Report-final-12-24-13a.pdf.

Picus, L. O. &Seder, R. (2010). Recalibration of maintenance and operation costs. In Lawrence O. Picus and Allan Odden. *2010 Cost of Education Study: Submitted to the Select School Finance Committee of the Wyoming State Legislature*. Los Angeles, CA: Lawrence O. Picus and Associates. Available at: www.picusodden.com under policy impact.

Picus, L. O., Odden, A. & Goetz, M. 2009. An Evidence Based Approach to Estimating the National and State by-State Costs of an Integrated Preschool-3 rd Education Program. Prepared for the Fund for Child Development. Available at: http://www.PicusOdden.com.

Picus, L.O., Odden, A., Goetz, M. &. Aportela, A. 2012. *Estimating the Cost of an Adequate Education for Texas School Districts Using the Evidence-Based Model. Available at:* http://www.PicusOdden.com.

Picus, L.O., Odden, A., Goetz, M., Griffith, M., Glenn, W., Hirshberg, D. & Aportela, A. *An Independent review of Maine's Essential Programs and Services Funding Act: Part 1*. North Hollywood, CA: Lawrence O. Picus and Associates. Available at http://www.PicusOdden.com

Porowski, A., O'Conner, R. &Luo, J.L. (2014). *How Do States Define Alternative Education?* (REL 2014–038). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Mid-Atlantic. Retrieved from http://ies.ed.gov/ncee/edlabs.

Posner, J. &Vandell, D. L. (1994). Low-income children's after-school care: Are there beneficial effects of after-school programs? *Child Development, 65*, 440-456.

President's Commission on Excellence in Special Education (2002). *A new era: Revitalizing special education for children and their families.* Washington, DC: US Department of Education.

Raudenbusch, S. (2009). The Brown Legacy and the O'Connor Challenge: Transforming schools in the images of children's potential. *Educational Researcher,38*(3), 169–180.

Ravitch, D. (2004). The mad, mad world of textbook adoption. Fordham Institute. Maryland: District Creative Printing. Also available at www.edexcellence.net.

Raywid, M.A. (1997/1998). Synthesis of research: Small schools: A reform that works. *Educational Leadership, 55*(4), 34-39.

Reaves, B.A. (3013). *Local Police Departments, 2013: Personnel, Policies, and Practices*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. May 2015, NCJ 248677. Available at http://www.bjs.gov/content/pub/pdf/lpd13ppp.pdf last accessed 9/25/15

Reynolds, A.J. & Temple, J.A. (2006). Economic Returns of Investments in preschool Education. in Zigler, E., Gilliam, W.S. and Jones, S.M. (2006). *A Vision for Universal Preschool Education*. New York, NY: Cambridge University Press. pp. 37-68.

Reynolds, A.J. &Temple, J.A. (2008). Cost-Effective Early Childhood Development Programs from preschool to Third Grade. *American Review of Clinical Psychology*. 4:109-39.

Reynolds, A. J., Temple, J. A., Ou, S., Arteaga, Irma A. & White, A.B. (2011). School-based early childhood education and age-28 well-being: Effects by timing, dosage and subgroups. *Sciencexpress*. Downloaded July 7, 2011 from www.sciencemag.org.Reis, S.M., and Purcell, J.H. (1993). An analysis of content elimination and strategies used by elementary classroom teachers in the curriculum compacting process. *Journal for the Education of the Gifted*, *16*(2), 147-170.

Reis, S.M., Westberg, K.L., Kulikowich, J., Caillard, F., Hebert, T., Plucker, J., Purcell, J.H., Rogers, J.B. & Smist, J.M. (1993). Why not let high ability students start school in January? The curriculum compacting study (RM93106). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

*Roberts, G. (2000, September). *Technical Evaluation Report on the Impact of Voyager Summer Programs*. Austin, TX: University of Texas.

Robinson, A. & Clinkenbeard, P.R. (1998). Giftedness: An exceptionality examined. *Annual Review of Psychology*. *49*(1), 117-139.

Rodney, M. J., Lance, K. C., and Hamilton-Pennell, C. (2003). *The Impact of Michigan school librarians on academic achievement: Kids who have libraries succeed*. Lansing, MI: Library of Michigan.

Rowan, B., Correnti, R. & Miller, R.J.(2002). What large-scale, survey research tells us about teacher effects on student achievement: Insights from the *Prospects* Study of Elementary Schools. *Teachers College Record*, *104*(8), 1525-1567.

Russo, A. (2007). *The Key to NCLB Success: Getting in Right from the Start*. Washington, DC: New American Foundation, Issue Brief #5 (May 21).

Sauers, N. & Mcleod S., (2014). *What Does the Research Say About One-to-One Computing Initiatives?* UCEA Center for the Advanced Study of Technology Leadership in Education, University of Kentucky. Available at: http://www.natickps.org/CASTLEBrief01_LaptopPrograms.pdf. Last Retrieved August 7, 2015.

Schweinhart, L. J., Montie, J., Xiang, Z., Barnett, W. S., Belfield, C. R. & Nores, M. (2005). *Lifetime effects: The High/Scope Perry preschool Study through Age 40*. Ypsilanti, MI: High/Scope Educational Research Foundation.

Seder, R. (2012). *Review and Evaluation of the Method to Calculate School Building Capacity*. Report the Wyoming School Facilities Department. mimeo, June, 2012.

Shanahan, T. (1998). On the effectiveness and limitations of tutoring in reading. *Review of Research in Education, 23, 217-234*. Washington, DC: American Educational Research Association.

Shanahan, T. & Barr, R. (1995). Reading recovery: An independent evaluation of the effects of an early instructional intervention for at-risk learners. *Reading Research Quarterly, 30*(4), 958-997.

Slavin, R. (1987). Ability Grouping and Student Achievement in Elementary Schools: A Best Evidence Synthesis. *Review of Educational Research,* 57: 293-336.

Slavin, R. (1992). The Nongraded Elementary School: Great Potential But Keep it Simple. Educational Leadership, 50(2), 24-24.

Slavin, R. E. (1996). Neverstreaming: Preventing learning disabilities. *Educational Leadership*, *53*(4), 4-7.

Slavin, R.E., Karweit, N. &Wasik, B. (1994). *Preventing early school failure: Research policy and practice*. Boston: Allyn and Bacon.

Slavin, R. & Cheung, A. (2005). A synthesis of research on language of reading instruction for English language learners. *Review of Educational Research*, *75*(2), 247-284.

*Slavin, R. E., Madden, N., Calderon, M., Chamberlain, A. & Hennessy, M. (2011). Reading and language outcomes of a multi-year randomized evaluation of transitional bilingual education. *Educational Evaluation and Policy Analysis, 33*(3), 47–58.

Southern, W.T., Jones, E.D. & Stanley, J.C. (1993). Acceleration and enrichment: The context and development of program options. In K.A. Heller, F.J. Monks and A.H. Passow (Eds.), *International handbook of research and development of giftedness and talent* (pp. 387-410). Exeter, United Kingdom: Pergamon.

Steinberg, L. (1996). *Beyond the classroom: Why school reform has failed and what parents need to do*. New York: Simon and Schuster.

Steinberg, L. (1997). Standards outside the classroom. In D. Ravitch, (Ed)., *The state of student performance in American schools: Brookings Papers on education policy, volume 1*. Washington, DC: Brookings Institution.

Steiny, J. (2009). A work in progress: Formative assessments shape teaching and provide mutual professional development. *Journal of Staff Development*, 30(3), 32-37.

Stringfield, S., Ross, S. & Smith, L. (1996). *Bold plans for school restructuring: The New American Schools designs.* Mahwah, NJ: Lawrence Erlbaum (1996)

Stoddard, C. (2015). *Teacher and Non-Teacher Labor Markets In Wyoming*. Report prepared for the 2015 Wyoming Select Committee on School Finance Recalibration. Available at: http://legisweb.state.wy.us/InterimCommittee/2015/SSRRpt1001AppendixB-1.pdf.

Storrow, B. Wyoming's Oil Booms Means Hotel Rooms Are Hard to Find. *Casper Star-Tribune Online*. Casper Star Tribune Communications, 21 Sept. 2014. Web. 15 Aug. 2015. <http://trib.com/business/energy/wyoming-s-oil-booms-means-hotel-rooms-are-hard-to/article_a3a85264-f029-5e73-ab43-3e3dae830414.html>.

Struck, J. (2003, April). *A study of talent development in a predominantly low socioeconomic and/or African American population*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Stuebing, K.K., Fletcher, J.M., LeDoux, J.M., Lyon, G.R., Shaywitz, S.E. & Shaywitz, B.A. (2002). Validity of IQ-discrepancy classifications of reading disabilities: A meta-analysis. *American Educational Research Journal, 39*, 469-518.

Suitts, S. (2008). *Time to Lead Again: The Promise of Georgia Preschool*. Atlanta, GA: The Southern Education Foundation, Inc.

Swift, E. (2005). *Estimating the central office resources necessary for an adequate educational program.* Doctoral dissertation at the USC Rossier School of Education, August 2005.

Taylor, L.L. (2015). *External Cost Adjustments for the Wyoming School Funding Model: 2015.* Submitted to The Select Committee on School Finance Recalibration, October 2015. Available at: http://legisweb.state.wy.us/InterimCommittee/2015/SSRRpt1001AppendixD-1.pdf.

Taylor, L.L. (2015). *Options for Updating Wyoming's Regional Cost Adjustment*. Submitted to The Select Committee on School Finance Recalibration, October 2015. Available at: http://legisweb.state.wy.us/InterimCommittee/2015/SSRRpt1001AppendixC-1.pdf.

Takanishi, R. & Kauerz, K. (2008). PK Inclusion: Getting Serious About a P-16 Education System. Phi Delta Kappan, 89(7) March, 2008. pp. 480-487.

Tenopir, C. (2003). Use and users of electronic media sources: An overview and analysis of recent research studies. Washington DC: Council of Library and Information.

Torgeson, J. K. (2004). Avoiding the devastating downward spiral. *American Educator*, *28*(3), 6-19, 45-47.

Vandell, D.L. (2014). Associations between Structured Activity Participation and Academic Outcomes in Middle Childhood: Narrowing the Achievement Gap? Under review at *Educational Researcher*.

Vandell, D. L., Pierce, K. M., and Dadisman, K. (2005). Out-of-school settings as a developmental context for children and youth. In R. Kail (Ed.) *Advances in Child Development and Behavior, 33*. Academic Press.

VanTassel-Baska, J., Bass, G., Ries, R., Poland, D. & Avery, L.D. (1998). A national study of science curriculum effectiveness with high ability students. *Gifted Child Quarterly*, *42*(4), 200-211.

VanTassel-Baska, J., Johnson, D.T. & Avery, L.D. (2002). Using performance tasks in the identification of economically disadvantaged and minority gifted learners: Findings from Project STAR. *Gifted Child Quarterly*, *46*, 110-123.

VanTassel-Baska, J., Johnson, D.T., Hughes, C.E. & Boyce, L.N. (1996). A study of language arts curriculum effectiveness with gifted learners. *Journal for the Education of the Gifted*, *19*, 461-480.

VanTassel-Baska, J., Zuo, L., Avery, L.D. & Little, C.A. (2002). A curriculum study of gifted student learning in the language arts. *Gifted Child Quarterly, 46*, 30-44.

Veenman, S. (1995). Cognitive and Noncognitive Effects of Multigrade and Multi-Age Classes: A Best Evidence Synthesis. Review of Educational Research, 65(4), 319-381.

Wasik, B. & Slavin, R.E. (1993). Preventing early reading failure with one-to-one tutoring: A review of five programs. *Reading Research Quarterly*, *28*, 178-200.

Whitehurst, G. J. & Chingos, M. M. (2010). *Class size: What research says and what it means for state policy*. Washington, D.C.: The Brookings Institution.

Whitmire, R. (2014). *On the Rocketship*. San Francisco: Jossey-Bass.

*Word, E., Johnston, J., Bain, H., Fulton, D.B., Boyd-Zaharias, J., Lintz, M.N., Achilles, C.M., Folger, J. & Breda, C. (1990). *Student/teacher achievement ratio (STAR): Tennessee's K-3 class-size study.* Nashville, TN: Tennessee State Department of Education.

Wright, P., Horn, S. P. & Sanders, W. L. (1997). Teacher and classroom context effects on student achievement: Implications for teacher evaluation. *Journal of Personnel Evaluation in Education, 11*(1), 57–67.

WDE (2013). *Wyoming School Safety and Security Task Force: Report and Recommendations*. Cheyenne, WY: Wyoming Department of Education, October 24, 2013.

Young, E., Green, H.A., Roehrich-Patrick, J.D., Joseph, L. & Gibson, T. (2003). *Do K-12 School Facilities Affect Educational Outcomes?* Tennessee Advisory Commission on Intergovernmental Relations (TACIR), January 2003.

Youth Risk Behavior Survey. Available at http://www.cdc.gov/Features/YRBS/. Accessed 9/23/15.

Zaff, J., Moore, K., Romano Papillo, A. & Williams, S. (2003). Implications of Extracurricular Activity Participation During Adolescence on Positive Outcomes, *Journal of Adolescent Research*, 18(6): 599–623.

Zigler, E., Gilliam, W.S. & Jones, S.M. (2006). *A Vision for Universal Preschool Education*. New York, NY: Cambridge University Press.

Zureich, M. (1998). *CASBO: Staffing formula hoax*. Pleasanton, CA: Research and Development Committee, California Association of School Business Officials. #0902.

Appendix A: Biographies of Consultants

Kent Belcher

Kent last served as superintendent of the Corona-Norco Unified School District, the 9th largest school district in California until 2012. Corona-Norco Unified School District was named a 2012 finalist for the $1 million Broad Prize for Urban Education. The Broad Prize for Urban Education is the largest education prize in the country, honoring school districts that demonstrate the greatest overall performance and improvement in student achievement, while reducing achievement gaps among poor and minority students.

He also served as superintendent in Walnut Valley Unified and Duarte Unified School Districts. He held positions of Assistant Superintendent, Principal, Assistant Principal, Teacher and Coach.

He was named the 2012 California Superintendent of the Year by the Association of California School Administrators.

Kent has extensive training experience in management, leadership, systems, policies and procedures, strategic planning, labor relations, and developing collaboration and teamwork within organizations. He is well known for developing trusting relationships, team building and resolving organizational conflict. His academic work includes teaching adjunct classes at the university level and consulting with educational institutions, businesses and other organizations.

During Kent's 32 year career in K-12 education, he served in professional organizations including Association of California School Administrators (ACSA), California Collaborative on District Reform, American Association of School Administrators (AASA), Southern California Superintendents, Urban Education Dialogue and Educational Research Development Institute (ERDI).

Kent received a bachelor's degree in social work from Azusa Pacific University, a master's degree in educational administration from California State University – Los Angeles and a Ph.D. in education from Claremont Graduate University.

Jennifer Bolton Carls

Jennifer Bolton Carls is the Deputy Superintendent of the Otsego Northern Catskills BOCES in Grand Gorge, New York. She is responsible for organizational leadership and oversight of the BOCES Operations. She previously served as the Chief Operating Officer of the BOCES as well as the Assistant Superintendent for Management Services. She was the Director of Finance in the Erie 2 Chautauqua Cattaraugus BOCES from 2002 to 2005, and has business office experience in other school districts. She was a member of the NYSASBO Board of Directors and serves on numerous other organization boards of directors. Carls has an Ed.D. in Educational Leadership and Technology from Dowling College as well as a master's degree from Long Island University and a bachelor's degree from the University at Buffalo.

Melissa deVita

Melissa de Vita is the Deputy Superintendent for Finance and Operations in the Bellevue School District in Bellevue, Washington. Prior to her appointment in Bellevue, she was the Executive Director of Support Services/Chief Financial Officer for the Mesa County Valley School District in Grand Junction, Colorado. She was also a partner in PricewaterhouseCoopers Consulting from 1986 through 2001. deVita holds a bachelor's degree from Kettering University and a MBA from the University of Michigan.

Mike Escalante

Mike served as Superintendent of the Glendale Unified School District in Los Angeles County and the Fullerton Joint High School District in North Orange County for a total of 13 years, 6 ½ in each district. He served as Assistant Superintendent of Business, and Principal at the elementary, middle and high school levels. Mike also taught at the elementary, high school and university levels.

Currently, Mike serves as a doctoral level instructor at the University of Southern California Rossier School of Education, teaching educational leadership and chairing doctoral dissertations. Mike's current academic interest is in the area of building effective board superintendent relationships.

During Mike's 38 year career in public education, he served in professional organizations including Association of California School Administrators, the USC Dean/ Superintendent Advisory Committee Southern, Southern California Superintendents, Urban Education Dialogue, Educational Research Development Institute (ERDI), California Latino Superintendents' and Administrators' Association, Association of Latino Administrators and Superintendents , and California Teachers' Association, where he served as President of the Hawthorne Teachers' Association.

Mike earned his bachelor's degree from San Diego State University, Master in Education from Loyola Marymount University and Doctorate in Educational Leadership from the University of Southern California.

Claire Hertz

Claire Hertz is currently the Chief Financial Officer for the Beaverton School District in Beaverton, Oregon. She is responsible for the fiscal Operations of a 40,000 student school district and a $995 million annual budget. She previously served in fiscal management positions in several other Oregon school districts and has a background in the private sector having worked as the controller for a law firm in Los Angeles. She was a member of the Board of Directors of the Association of School business officials International, and is active in the Government Finance officers Association, the Oregon Association of School Business Officials (where she served as President in 2008), and the Organization for Educational Technology and Curriculum (where she was President in 2009. Hertz holds a bachelor's degree from UCLA and a Master of Science in School Business Leadership from Wilkes University. She also participated in Harvard's Executive Leadership program from 2008-2010.

Dennis M. Smith

Dennis served as Superintendent of Schools for the Placentia Yorba Linda Unified School District (25,000 ADA) in Orange County until June of 2012. Dennis also served as superintendent of the Orange County Public Schools in Orlando, Florida, the 16th largest school district in the United States. Prior to that, he served as superintendent of the Irvine Unified School District, Cajon Valley Union School District and the Laguna Beach Unified School District. Dennis served a total of 26 years as a Superintendent of Schools.

Dennis was recognized as one of the top 100 Executive Educators in North America by the National School Boards Association, one of the 89 Rising Stars to Watch by the Los Angeles Times, one of the 100 Most Influential Business Leaders in Central Florida by the Orlando Business Journal, and the ACSA Region XVII Superintendent of the Year. He also served as President of the Southern California Superintendents' Association.

Dennis has spoken at the local, state and national level on Board-Superintendent relations, Strategic Planning and Goal Setting and Organizational Management. He has consulted with school districts across the United States assisting school boards with superintendent searches and conducting workshops, trainings and organizational efficiency audits.

Dennis received his bachelor's degree and master's degree from Arizona State University and his Doctorate from the University of Arizona. In addition, he has been an adjunct faculty member at California State University, Fullerton and held positions as assistant superintendent, principal and teacher.

William A. Sutter

Bill Sutter is the Chief Financial officer for the Boulder Valley School District in Boulder, Colorado. He has served in that position since 2014 and has held other fiscal office positions in that district since 2001. Boulder school district has 30,000 students, 4,000 employees and a budget of over $500 million. Sutter is a Certified Administrator of school Finance and Operations through ASBO, holds a Project Management Professional Certification (PMP through the Project Management Institute, served as President of the District Business Officials of the Colorado Association of school Executives, and is a member of the Colorado School Finance Project Board of Directors. Sutter holds a bachelor's degree in business administration and history from the University of New Hampshire and a MBA from the University of Colorado, Leeds School of Business.

2015 WYOMING RECALIBRATION REPORT: ADDENDUM

Prepared for the
Wyoming Select Committee on School Finance Recalibration

Allan Odden
Lawrence O. Picus

PICUS ODDEN & ASSOCIATES

January 2016

INTRODUCTION

In review of Model Element 25 Food Service Programs, data and formula errors were discovered after completion of the November 2015 report "2015 Wyoming Recalibration Report." Specifically, the data used has been updated to include:

- all breakfast meals, not only the non-severe need breakfasts claimed,
- the prices for the federal reimbursements have been changed to reflect SY 2014-15 amounts, not the SY 2015-16 amounts, and
- the general fund transfer amounts have been updated using data from the Wyoming Department of Education.

Regarding the formulas, errors were discovered that incorrectly calculated the estimated per meal amount that was recommended if the Legislature chose to subsidize food service program, changing from $0.47 to $0.86 and the estimated subsidy would increase from slightly more than $5.0 million to slightly more than $9.0 million.

25. Food Service Programs

Both the EB Model and the Legislative Model assume a school district's food service program is a self-supporting function. Consequently no additional resources are provided for food service programs in the EB Model. However, Wyoming school districts currently spend approximately $9.8 million more for school food services than they collect in meal charges and federal and state subsidies.[1]

2010 Evidence-Based Recommendation	Legislative Model (Current Law)	2015 Evidence-Based Recommendation	Estimated Cost Difference
Assumed self-supporting.	Assumed self-supporting.	Assumed self-supporting but if Legislature seeks to subsidize food services it should be on a meal times rate basis	N/A

Additional Analysis for the 2015 Recalibration

At the September 2 and 3 meeting of the Select Committee on School Finance Recalibration, we presented a food services recommendation at the direction of the Select Committee. We maintain our previous position that school food services can be self-supporting, but also noted in smaller school districts with relatively low (compared to the national average) percentages of children eligible for free and reduced price lunches, there was a strong likelihood districts would have to subsidize their food service programs. We also noted most districts charged varying amounts for paid meals, and recommended that if the Legislature wanted to subsidize school food programs it should establish a categorical grant program to fund district food service programs on an amount based on the assumption paid meals were charged the federal subsidy amount.

Based upon conversations with food service program personnel at the WDE, we believe if the Legislature feels subsidies for food services are warranted, it should determine the overall level of subsidy it believes is needed and then provide the subsidy to all districts on a meals times rate basis, assuming the district meets established accounting standards for food service programs.

[1] Although food services are not funded in the EB or Legislative Models, in order to receive federal nutrition funding, the State must appropriate just under $500,000 a year to the program.

To estimate the potential categorical grant subsidy, we took the number of paid lunches (meals purchased by students not eligible for free and reduced price meals), estimated what the full federal subsidy would be for those meals if the students were eligible for free meals, and then compared that to what each district received for a paid meal including federal funding subsidies, federal food commodity effective subsidy (the value of federally provided food per meal) and the price paid for each paid meal. We then subtracted the difference from the data showing the district provided subsidy and the remaining balance, if any, represented the amount of the proposed categorical grant.

Determining Meal Prices

The first step in estimating the potential categorical grant subsidy is to determine what a subsidized meal's value is. Table 3.23 displays the figures we used for federal subsidies for lunch and breakfast for free meals, reduced price meals and paid meals for SY 2014-15. The subsidy for lunch includes six cents per meal for meeting federal nutrition guidelines. We did not include the severe need meal subsidies because no districts received them for lunch in SY 2014-15. Although some districts received severe need meal subsidies for breakfast, what we are interested in is the paid meals and comparison between income per meal using the districts' paid meal prices, and the amount the districts receive for subsidized meals.

Table 3.23 Federal Reimbursements per Meal Type

Meal Type	Free	Reduced Price	Paid	Performance-Based Reimbursement	USDA Food Entitlement	Paid Claimed Meal Reimbursement
Lunch	$2.98	$2.64	$0.34	$0.06	$0.2475	$0.5875
Breakfast: Non-Severe Need	$1.62	$1.32	$0.28	$0.00	$0.00	$0.2800
Breakfast: Severe Need	$1.93	$1.63	$0.28	$0.00	$0.00	$0.2800

Source: WDE.

As displayed in Table 3.23, there is a United States Department of Agriculture food entitlement each district receives in the form of food from the federal government for each paid lunch. In SY 2014-15, this subsidy amounted to $0.2475 per meal. In effect, for a paid lunch, total federal reimbursement equals $0.5875 ($0.34 cash and $0.2475 food equivalent) and for a paid breakfast it equals $0.2800.

Our comparison for each district can be estimated as:

Lunches

(number of paid lunches) x (total federal subsidy [$0.5875]) x (price charged for paid meals [district specific]) = district revenue for paid meals

Breakfasts

(number of paid breakfasts) x (total federal subsidy [$0.2800]) x (price charged for paid meals [district specific]) = district revenue for paid meals

The figure to which we would compare this is the revenue from the number of paid meals at the federal subsidy rates for free meals. We compute this for breakfasts and lunches separately, then sum the total and compare the district general fund subsidy to the amount of revenue they would receive when the

$0.5875 per lunch meal and $0.2800 per breakfast meal is combined with the revenue they would generate from the number of paid meals times the price charged.

Table 3.24 displays the prices each school district charged in SY 2014-15 for paid school lunches and Table 3.25 displays the prices each district charged in SY 2014-15 for paid breakfasts.

Table 3.26 provides a summary of our computations for the potential categorical grant, which shows the estimated cost of our proposal would be slightly more than $9.0 million for SY 2014-15. The second and third columns of display the number of paid lunches and breakfasts served by each school district under the National School Lunch Program. The fourth column in Table 3.26 displays the amount of additional revenue a school district would have received (beyond the prices it charges and the federal paid meal subsidy of $0.5875 per lunch and $0.2800 for breakfast) if it charged enough to receive $2.98 for paid lunches, $1.92 for paid breakfast (severe need) and $1.62 for paid breakfasts (non-severe need), minus the price they charge and federal subsidies they receive for those meals. If this option was used, and the Legislature was to appropriate funds on a per meal basis, this would amount to approximately $0.86 for each of 10.5 million meals served in SY 2014-15. The level of the subsidy could be adjusted up or down by the Legislature, with resultant changes in the subsidy per paid meal.

There are additional issues or caveats to consider related to food service programs:

Price of Meals and Number of Paid Meals

There are many factors that impact the price districts charge for meals, and little data on the elasticity of demand for school meals (the impact an increase in price has on the number of meals purchased). This analysis has assumed the number of paid meals remains the same if the price were increased. This is unlikely to be the case, which means our estimate of the revenue a district would receive if it charged the same price as the subsidy is probably too high. There were no studies we could identify that specifically estimate these elasticities so it is impossible to estimate the exact impact.

Local Control

Based upon school district testimony, school districts make a number of choices as to how to prepare food, what types of food to purchase (organic, fresh, etc.) and also decide what price to charge. While such local control is an important Wyoming characteristic, establishment of state funding for any expenses beyond federal subsidies and locally charged prices creates a number of disincentives for school districts to search for market prices for meals or to operate efficiently. Hence our suggestion a categorical grant should be based on the costs above what the district would receive if it charged the total federal subsidy for paid meals.

Alternative Pricing

Three of the school districts in Fremont County do not have a price for paid meals; consequently they generate zero categorical grant assistance in our scenario, although each of them makes a contribution to food services from their general fund. Park County School District #16 does not appear to participate in the National School Lunch Program, and thus does not generate categorical funding in this scenario and data on the number of meals served and how they are paid for were not available from WDE.

Grade Level Lunch Participation

Although many school districts charge different prices for meals to students in elementary, middle and high schools, the WDE did not have data on the number of paid meals served by school level.

Consequently, our revenue estimates for the revenue schools generated for paid meals assumed an equal number of students per grade and distributed the price to lunches proportionally (i.e. 6/13 of the meals were paid for at the elementary rate, 3/13 at the middle school rate and 4/13 at the high school rate.

No Standardized Accounting System for Food Services

The WDE indicated there is not a standardized accounting system for school food service programs among Wyoming school districts which causes the measurement of total costs to differ across districts. For example, not all districts include indirect costs or the costs of custodial services for food service areas in the food services budget, further reducing the reliability of the data used to make our estimates for this memo.

Reporting General Fund Subsidies

The data received from the WDE are the fiscal year 2014-15 general fund contributions, which were $10.7 million.

Table 3.24 School Lunch Prices by District: SY 2014-15

District	Elementary	Middle	High School	District	Elementary	Middle	High School
Albany #1	$2.55	$2.80	$2.80	Lincoln #1	$3.30	$3.35	
Big Horn #1	$2.35	$2.65	$2.65	Lincoln #2	$2.25	$2.35	$2.50
Big Horn #2	$2.15	$2.45	$2.45	Natrona #1	$2.50	$2.75	$2.75
Big Horn #3	$2.50	$2.75	$2.75	Niobrara #1	$2.50	$2.50	$3.00
Big Horn #4	$2.10	$2.40	$2.40	Park #1	$2.60	$2.85	$2.85
Campbell #1	$2.50	$3.00	$3.00	Park #6	$2.50	$2.75	$2.75
Carbon #1	$2.25	$2.50	$2.50	Park #16	Does not participate in the NSLP		
Carbon #2	$2.75	$3.00	$3.00	Platte #1	$2.70	$2.70	$2.70
Converse #1	$2.65	$2.95	$2.95	Platte #2	$2.25	$2.50	$2.50
Converse #2	$2.25	$2.50	$2.50	Sheridan #1	$2.50		
Crook #1	$2.20	$2.30	$2.30	Sheridan #2	$2.50	$2.75	$3.00
Fremont #1	$2.25	$2.50	$2.50	Sheridan #3	$2.00	$2.35	$2.35
Fremont #2	$2.25	$2.50	$2.75	Sublette #1	$2.55	$2.80	$2.80
Fremont #6	$2.25	$2.50	$2.50	Sublette #9	$2.15	$2.50	$2.50
Fremont #14	Non-Pricing Program			Sweetwater #1	$2.85	$3.50	$3.50
Fremont #21	Non-Pricing Program			Sweetwater #2	$2.50	$2.75	$3.00
Fremont #24	$2.25	$2.55	$2.55	Teton #1	$2.50	$2.75	$3.00
Fremont #25	$1.90	$2.15	$2.15	Uinta #1	$2.30	$2.60	$2.90
Fremont #38	Non-Pricing Program			Uinta #4	$2.00	$2.25	$2.25
Goshen #1	$2.25	$2.45	$2.60	Uinta #6	$2.00	$2.25	$2.50
Hot Springs #1	$2.25	$2.55	$2.55	Washakie #1	$2.90	$3.15	$3.75
Johnson #1	$2.75	$3.00	$3.25	Washakie #2	$2.00	$2.50	$2.50
Laramie #1	$2.40	$2.60	$2.60	Weston #1	$2.50	$3.00	$3.00
Laramie #2	$2.50	$2.75	$2.75	Weston #7	$2.50	$2.80	$2.80

Source: WDE

Table 3.25 School Breakfast Prices by District: SY 2014-15

District	Elementary	Middle	High School	District	Elementary	Middle	High School
Albany #1	$1.40	$1.90	$1.90	Lincoln #1	$1.75	$1.90	
Big Horn #1	$1.50	$1.70	$1.70	Lincoln #2	$1.25	$1.50	$1.50
Big Horn #2	$1.35	$1.50	$1.50	Natrona #1	$1.50	$1.75	$1.75
Big Horn #3	$1.65	$1.75	$1.75	Niobrara #1			
Big Horn #4	$1.35	$1.35	$1.35	Park #1	$1.35	$1.60	$1.60
Campbell #1	$1.25	$1.50	$1.50	Park #6	$1.50	$1.75	$1.75
Carbon #1	$1.25	$1.75	$1.75	Park #16	Does not participate in the NSLP		
Carbon #2	$1.75	$1.75	$1.75	Platte #1			
Converse #1	$1.45	$1.50	$1.50	Platte #2	$1.00	$1.25	$1.25
Converse #2	$1.25	$1.40	$1.40	Sheridan #1	$0.50		
Crook #1	$1.35	$1.35	$1.35	Sheridan #2	$1.00	$1.25	
Fremont #1	$1.25	$1.25	$1.25	Sheridan #3			
Fremont #2	$1.25	$1.50	$1.75	Sublette #1	$1.50	$1.75	$1.75
Fremont #6	$1.00	$1.00	$1.00	Sublette #9	$1.50	$1.50	
Fremont #14	Non-Pricing Program			Sweetwater #1	$1.55	$2.15	$2.15
Fremont #21	Non-Pricing Program			Sweetwater #2	$1.75	$2.00	$2.25
Fremont #24				Teton #1	$1.30	$1.75	$1.75
Fremont #25	$1.25	$1.35	$1.35	Uinta #1	$1.50	$1.50	$1.50
Fremont #38	Non-Pricing Program			Uinta #4	$1.25		
Goshen #1	$1.50	$1.50	$1.50	Uinta #6			
Hot Springs #1	$1.75	$1.75	$1.75	Washakie #1	$2.20	$2.45	$3.00
Johnson #1	$1.50	$1.50	$1.50	Washakie #2			
Laramie #1	$1.25	$1.50	$1.50	Weston #1	$2.00	$2.25	$2.25
Laramie #2	$1.85	$1.85	$1.85	Weston #7	$2.00	$2.00	$2.00

Source: WDE

Table 3.26 Estimated Food Service Program Categorical Grant by School District, SY 2014-15

School District	Number of Paid Lunches	Number of Paid Breakfasts	Total Revenue At Free Meal Subsidy Rate Minus Estimated Actual Revenue	General Fund Contribution	Predicted Maximum Categorical Grant
Albany #1	165,047	24,490	$49,831	$405,798	$338,578
Big Horn #1	38,334	5,150	$19,618	$125,000	$81,218
Big Horn #2	40,552	4,980	$29,594	$102,100	$83,867
Big Horn #3	21,493	2,716	$8,038	$120,000	$54,067
Big Horn #4	15,451	2,532	$12,570	$60,000	$34,264
Campbell #1	477,692	87,847	$138,194	$820,000	$937,985
Carbon #1	77,593	8,037	$48,536	$350,000	$157,836
Carbon #2	34,591	7,917	$4,289	$175,000	$73,100
Converse #1	106,304	14,123	$19,929	$206,400	$171,365
Converse #2	37,206	4,787	$23,536	$150,000	$66,135
Crook #1	53,044	10,349	$43,942	$285,000	$104,243
Fremont #1	56,890	7,573	$39,021	$304,910	$137,366
Fremont #2	10,770	1,863	$5,879	$127,131	$17,002
Fremont #6	19,501	7,712	$18,783	$100,000	$50,426
Fremont #14	23,278	17,647	$0	$450,000	$153,678
Fremont #21	18,185	15,573	$0	$420,000	$115,011
Fremont #24	28,958	0	$16,462	$125,000	$39,535
Fremont #25	99,715	24,594	$109,669	$245,000	$289,454
Fremont #38	0	0	$0	$420,000	$86,644
Goshen #1	60,752	16,769	$42,213	$200,000	$179,286
Hot Springs #1	35,166	4,703	$20,837	$99,000	$73,066
Johnson #1	61,854	6,069	$3,423	$0	$111,946
Laramie #1	529,725	100,316	$299,889	$1,400,000	$1,449,081
Laramie #2	45,406	5,851	$16,151	$63,310	$103,978
Lincoln #1	20,577	3,299	$13,478	$83,000	$32,648
Lincoln #2	132,990	18,306	$93,126	$0	$247,173
Natrona #1	503,728	78,746	$192,608	$1,269,000	$1,200,108
Niobrara #1	11,035	0	$3,599	$35,000	$21,247
Park #1	100,233	11,185	$28,757	$0	$195,756
Park #6	58,862	9,665	$23,185	$100,000	$136,675
Park #16	0	0	$0	$92,168	$0
Platte #1	48,687	545	$14,684	$215,000	$76,445
Platte #2	11,684	2,657	$9,070	$55,000	$29,343
Sheridan #1	22,114	2,290	$43,398	$209,787	$38,928
Sheridan #2	140,981	17,218	$58,165	$110,000	$303,813
Sheridan #3	6,543	0	$5,179	$75,000	$9,044

School District	Number of Paid Lunches	Number of Paid Breakfasts	Total Revenue At Free Meal Subsidy Rate Minus Estimated Actual Revenue	General Fund Contribution	Predicted Maximum Categorical Grant
Sublette #1	78,690	8,783	$23,115	$100,000	$105,658
Sublette #9	41,003	2,211	$26,570	$255,000	$61,792
Sweetwater #1	174,648	23,347	($38,342)	$0	$458,090
Sweetwater #2	136,661	14,370	$35,206	$225,000	$244,233
Teton #1	149,107	20,095	$44,379	$127,908	$254,601
Uinta #1	146,143	17,006	$69,592	$408,555	$328,302
Uinta #4	62,883	4,049	$54,658	$90,000	$78,980
Uinta #6	39,141	0	$30,078	$112,000	$48,732
Washakie #1	64,466	8,978	($20,574)	$150,690	$161,996
Washakie #2	8,278	0	$5,884	$60,000	$9,874
Weston #1	48,481	5,303	$8,029	$55,000	$89,862
Weston #7	19,934	3,099	$5,171	$70,000	$35,214
Total	**4,084,376**	**632,750**	**$1,699,417**	**$10,651,758**	**$9,077,646**

Source: WDE and Authors' calculations.

2015 Evidence-Based recommendation: Our recommendation remains the same as in previous years that food services programs should be self-supporting. If, however, the Legislature believes school district food services programs should be subsidized, it should implement a subsidy for food services based on a rate times meals approach.

Teacher and Non-Teacher Labor Markets In Wyoming

Final report to Wyoming Select Committee on School Finance Recalibration

Dr. Christiana Stoddard

October 1, 2015

Chapter I

Labor Market for Teachers Employed by K-12 Districts in Wyoming

Teacher Labor Markets Executive Summary

Based on this analysis, Wyoming model salaries are at the top of regional salaries, enabling Wyoming to recruit teachers from many surrounding states and to maintain very low turnover rates. The model funding has enabled school districts to provide salaries that are highly competitive nationally. Wyoming is positioned to allow districts to compete more aggressively for teachers from more selective higher education institutions in the area.

The first section of this chapter shows that teaching salaries in Wyoming rose rapidly since 2000, and rose especially sharply after 2005. Model funded salaries have also increased over time, but actual salaries rose by even more. Teaching salaries rose rapidly in Wyoming compared to neighboring states, relative to other professional occupations, and relative to other comparable workers in Wyoming. Teaching wages in Wyoming are high relative to other occupations, at 94 percent of wages of other professional and technical workers with a twenty percent wage premium after adjusting for their shorter weeks of work. The US average and average in neighboring states remained between 75 and 80 percent. Actual teaching salaries relative to salaries of other comparable workers are the highest in the nation. Model salaries, both unadjusted and relative to the salaries of comparative workers, are the highest in the region and in the top third of the nation.

The second section of this chapter then asks how this increase affected the recruitment and retention of teachers. Overall teacher turnover remained constant during this period, with a modest rise since 2008. Exit rates of teachers are close to 10 percent, similar to recent years, but higher than the lowest rate of 7.5 percent in 2008/09. This is largely due to retirements: exit rates of new teachers remain at about 12 percent, right at the average since 2003 with no trend.

The vast majority of teachers who exit the profession in Wyoming earn significantly less in their subsequent employment. Average wages declined by about $23,000 for individuals who left teaching for another occupation. Wyoming increasingly recruits teachers from out of state, with about 70 percent of new hires coming from other states in 2014. However, these teachers are not necessarily from better institutions in the past: notably, there has been a rise in teachers with degrees from schools with large online programs. This is something that bears monitoring into the future to ensure continued teacher quality.

DATA SOURCES:

There are a number of sources of information about teaching salaries and salaries of other workers used in this chapter and throughout the report. **Table 1** summarizes these data sources.

- The Wyoming Department of Education (WDE) staffing files report salaries for all teachers in Wyoming. This is the most complete source of information about the characteristics and salaries of teachers in Wyoming.
- U.S. Department of Labor reports salaries by occupation in the Occupational Employment Statistics (OES) survey each November and May. This is the most rapidly available source of general employment information, making it useful for monitoring external markets. The survey is only of employers; it does not include personal characteristics of workers. These data cannot be used to adjust for workers' characteristics (e.g., work experience, education, hours of work) or benefits.
- The American Community Survey (ACS) is a mini-Census survey of individuals who report their own salary as well as their own characteristics. This source has smaller samples of individuals, but allows for comparisons of teachers with other workers who have similar personal and job characteristics.
- The National Education Association (NEA) reports average teaching salaries for full time workers based on data reported by state education agencies. This data source is the most current source of teaching salary information across states, with one year of data beyond the OES estimates. The U.S. Department of Education's National Center for Education Statistics (NCES) uses these wage series in reports of teacher salaries.

Table 1: Comparison of Data Sources

Data Source	Latest year available	Comparison with other workers	Able to adjust for age, personal characteristics education, hours/weeks worked
WDE Staffing Files	2014-15 school year	None	Teachers only
NEA	Estimates through 2014-15 school year	Compare average teaching salaries with average salaries in other states	No
OES	May 20145	Yes—comparisons by occupation	Full time, full year only
ACS	2014	Yes	Yes

How Competitive are Wyoming Teaching Salaries?

How attractive is the teaching profession in Wyoming? The first section of this chapter compares teaching salaries in Wyoming both over time and compared to the model funded salaries. While this clearly shows that teaching salaries have increased sharply over time, the attractiveness of teaching still depends in part on how teaching salaries compare with other alternatives.

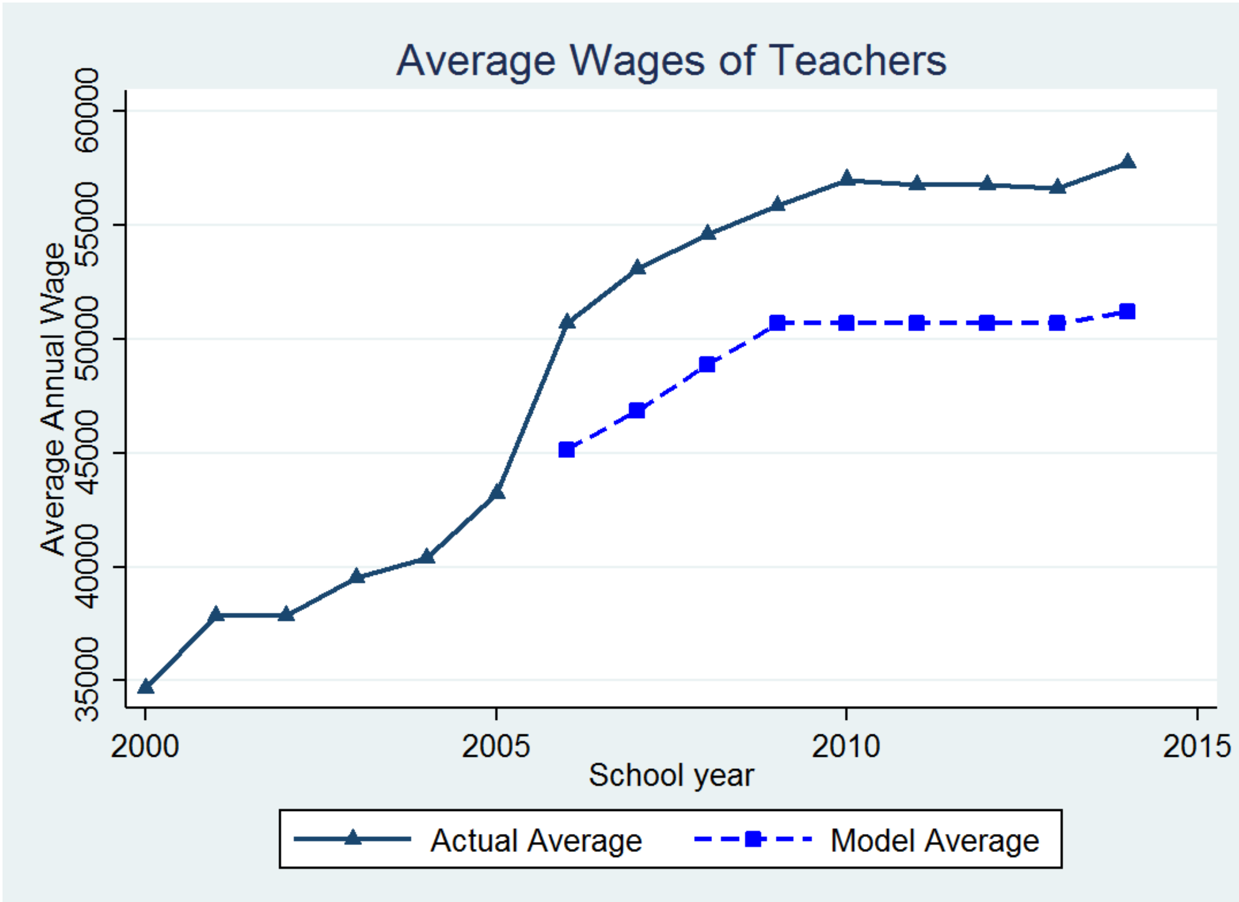
Several comparisons are relevant for different groups of potential and actual teachers. New teaching graduates and other existing teachers in the region likely compare salaries in Wyoming with salaries in other states when deciding where to live. These cross-state comparisons reflect the attractiveness of Wyoming to individuals who have already decided to become teachers. It is also important to consider the relative attractiveness of teaching to that of other occupations. For example, a college student who plans to live in Wyoming might compare teaching salaries in Wyoming with salaries in a broad range of professional fields in the state when deciding what occupation to choose. This comparison reflects that decision.

Finally, current teachers in Wyoming weigh their teaching salary against their options in other occupations in Wyoming when deciding whether to remain in teaching. Current teachers' options may depend on their age, education level, gender, number of hours they would like to work, and other individual characteristics. Each of these comparisons is relevant for some group (new teaching graduates, college students deciding on a career, current teachers), and so there are alternative ways to rank the attractiveness of teaching in Wyoming relative to other states. However, the final section shows that regardless of the metric used, Wyoming ranks very high as one of the most attractive places to be a teacher in the United States.

A. How have salaries in Wyoming changed over time?

Figure 1 shows that teacher salaries in Wyoming rose rapidly from 2004 through 2010, and since then have plateaued. The trajectory largely followed the path of model salaries, except that in 2005, there was a large jump relative to the model, a gap which has persisted since then. Currently, actual average salaries are $57,715, which exceeded model salaries of $51,191 by more than 10 percent. The WDE's Continued Review of Educational Resources in Wyoming (CRERW) report includes weighted model salaries that predict model salaries based on experience and education, which average $52,724. Even compared to this adjusted salary, actual salaries are nearly 10 percent higher.

Figure 1: Actual Average Teaching Salaries and Average Teaching Salaries in the Wyoming Funding Model



Source: Wyoming Department of Education staffing files.

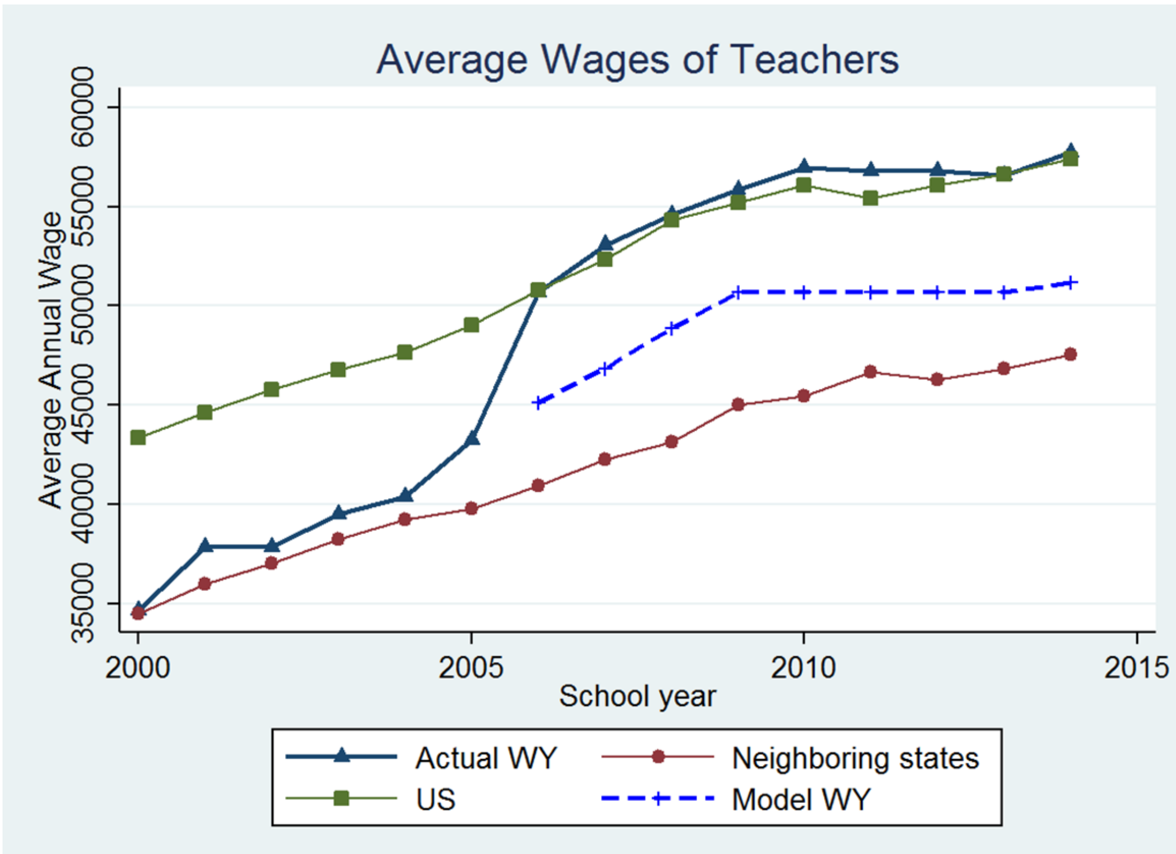
B. How do teaching salaries in Wyoming compare with salaries in other states?

The rise in salaries indicates that Wyoming is likely to have become a more attractive place to teach relative to the past. High teaching salaries relative to other locations enable Wyoming to recruit new teaching graduates and existing teachers from other states into Wyoming, and allow Wyoming to retain Wyoming teaching graduates and existing teachers in the state. How do model and actual salaries compare with other states?

Figures 2 and 3 show that average salaries in Wyoming have tracked average salaries in the United States very closely since 2006/07, holding steady between 2010-2012 when US salaries declined following the budget crises in many states, and then in the past two years tracking the US average closely.

Average salaries of Wyoming teachers rose by about 1.5 percent from 2010/11 through 2014/15 (from $56,978 in 2010-11 to $57,715 in 2014/15). Similarly in the U.S., average teacher wages rose by about 1 percent (from $56,069 in 2010/11to $56,689 in 2013/14). Teaching salaries in adjacent and comparison states have risen by about 6.5 percent over the last 3 years, although remaining about 19 percent lower than teaching salaries in Wyoming. Model salaries are intermediate, falling below US average salaries, but remaining about 5 percent higher than the regional average.

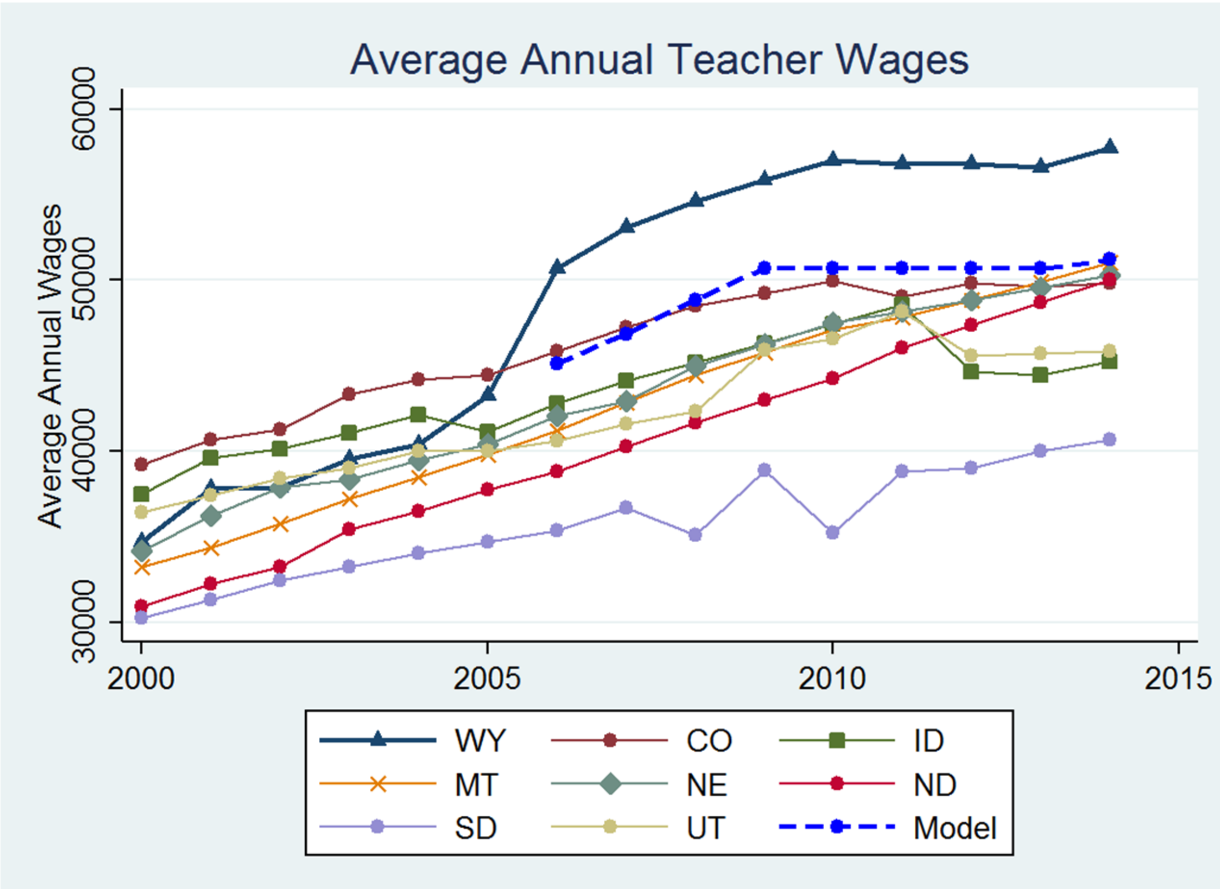
Figure 2: Comparing Average Teaching Salaries in Wyoming, in Neighboring States, and in United States



Source: NEA Rankings and Estimates, 2014

Figure 3 disaggregates this comparison across states. It shows that average salaries in Wyoming were roughly in the middle of other states in the region early in the 2000s: higher than salaries in Montana and South Dakota, roughly comparable to salaries in Utah and Nebraska, and lower than salaries in Colorado and Idaho. This was true until 2005, when Wyoming salaries increased sharply. Salaries are now well above the average salaries of all other states in the region and exceed the average salary for the United States as a whole. **Figure 3** also shows that salaries in the model are positioned just above the highest average salary of all the states in the region, currently just above those of Colorado, Montana, Nebraska, and North Dakota. Salaries of these highest paid states have grown to be increasingly clustered at around $50,000.

Figure 3: Comparing Average Teaching Salaries in Wyoming and in Neighboring States



Source: NEA Rankings and Estimates, 2014

C. How do teaching wages compare with wages of similar professionals?

How attractive is teaching in Wyoming compared with other occupations? This broad comparison is most relevant when considering the occupational choice of an individual who plans to live in Wyoming and is choosing a profession. For example, a college student will compare salaries in teaching with salaries in other professional and technical occupations.

The data allows for several sets of comparisons. The BLS classifies groups of similar occupations into broad categories. Teachers are members of the "*Professional and Technical Occupations*" group (OCC Codes 11-000 through 29-999). However, this group is very large, and certainly includes some occupations that are both higher and lower skilled than teaching. *Comparable occupations* are professional and managerial occupations that have skills and attributes most like teaching. These are defined by the Economic Policy Institute (EPI) based on their analysis of specific skills and attributes of jobs.[1] These occupations are listed in **Table 2.**

Table 2: Occupations Identified with Skills and Attributes Comparable to Teaching

Accountants and auditors	Registered nurses
Underwriters	Occupational therapists
Personnel training and labor relations specialists	Physical therapists
Inspectors and compliance officers, except construction	Trade and industrial teachers
Vocational and educational counselors	Architects
Forestry scientists, Conservation scientists	Archivists and curators
Technical writers	Clergy
Editors and reporters	Computer programmers

Source: Economic Policy Institute, 2004.

Figure 4 compares teaching salaries with salaries in other professional and technical occupations. Annual salaries in teaching are lower than those in other professional and technical occupations (although hours and weeks of work are lower and benefits are higher). However, this gap shrank considerably over this period, converging to be equal to those in comparable occupations in 2012, and then maintaining a gap of about 95 percent of the salaries of other professional and technical occupations. (Note that teaching salaries are typically lower than the salaries of other professional workers in part due to the high levels of benefits and relatively lower weeks and hours of work.[2])

[1] See Allegreto, Corcoran and Mishel (2004) for more details. The U.S. Bureau of Labor Statistics National Comepnsation Survey reports the skills and attributes of occupations along 10 dimensions including factors such as knowledge required, supervision received, and complexity of the tasks.

[2] See Podgursky and Tongrut (2006) for more work on this issue.

Figure 4: Comparing Average Teaching Salaries in Wyoming with Salaries for other Professional and Technical Occupations

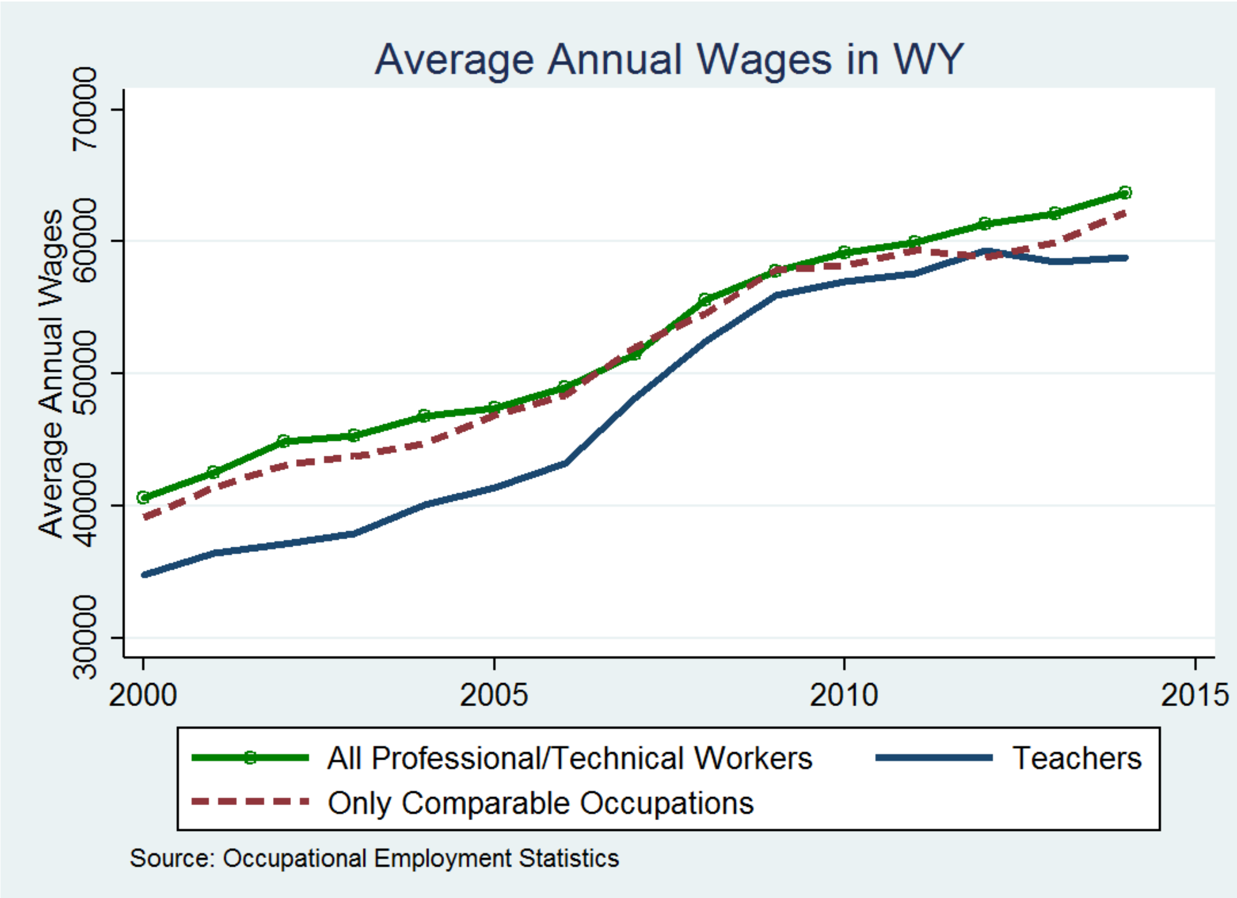


Figure 5 shows that this increasing ratio is unique to Wyoming. In 2005, the ratio of annual teaching wages to wages in other professional occupations was already higher than in the U.S. and in nearly all other states in the region, at about 85 percent. The ratio in Wyoming has remained close to 95 percent since 2008/09, although the latest year shows a decline to 93 percent. In the U.S., teaching wages are about 73 percent of the wages of other professionals, a ratio that has trended downward since 2005/06. The ratio in neighboring states is even lower. **Figure 6** disaggregates this for each of the neighboring and comparison states.

Part of the reason that annual wages in teaching are likely to be lower than in comparable occupations is that hours and weeks of work in teaching tend to be much lower. This will be explored in the next section.

Figure 5: Comparing Teaching Wage Ratios in Wyoming and Other Areas, Professional and Technical Occupations

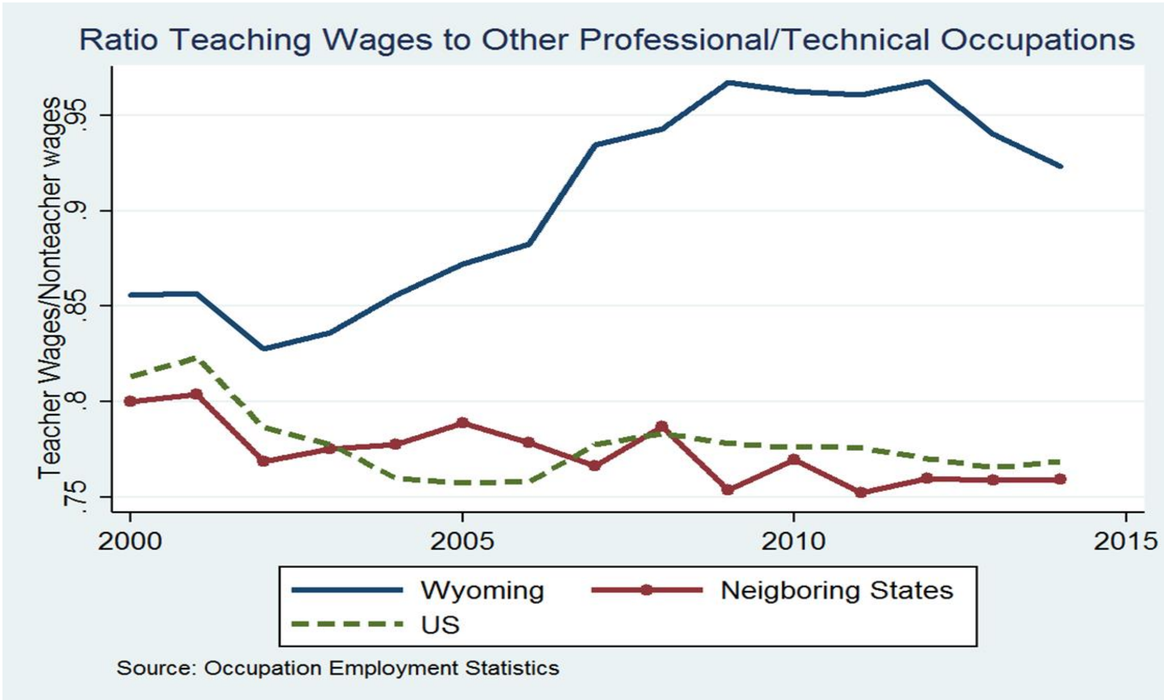
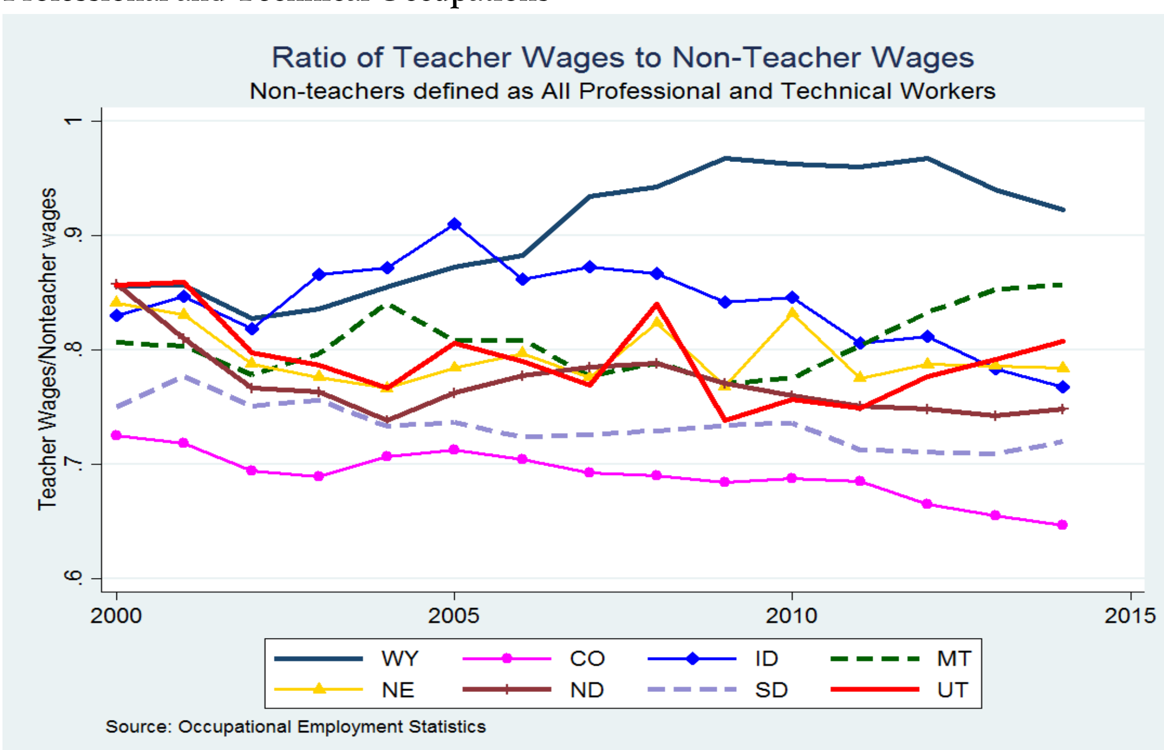


Figure 6: Comparing Teaching Wage Ratios in Wyoming and Other States, Professional and Technical Occupations



D. How do salaries compare with non-teaching salaries for similar workers?

These comparisons are useful when thinking about the occupational choices of all individuals in Wyoming. However, when current teachers consider staying in the profession or leaving for another occupation, it is more useful to compare their salaries to those of similar workers in jobs with similar characteristics. For example, all teachers in Wyoming have a bachelor's degree, so their salaries are best compared to those of other college graduates. Teachers in Wyoming are slightly older than other workers in Wyoming and therefore have more work experience. They are much more likely to be female and to have an advanced degree. They also work fewer hours and weeks of work than the average worker in Wyoming.

The American Community Survey is used to make these comparisons, as it has information about personal and job characteristics of individual workers. **Figure 7** first reports the average wages of teachers and of other college graduates in Wyoming.

Figure 7: Comparing Wages in teaching with Wages of Full time college graduates

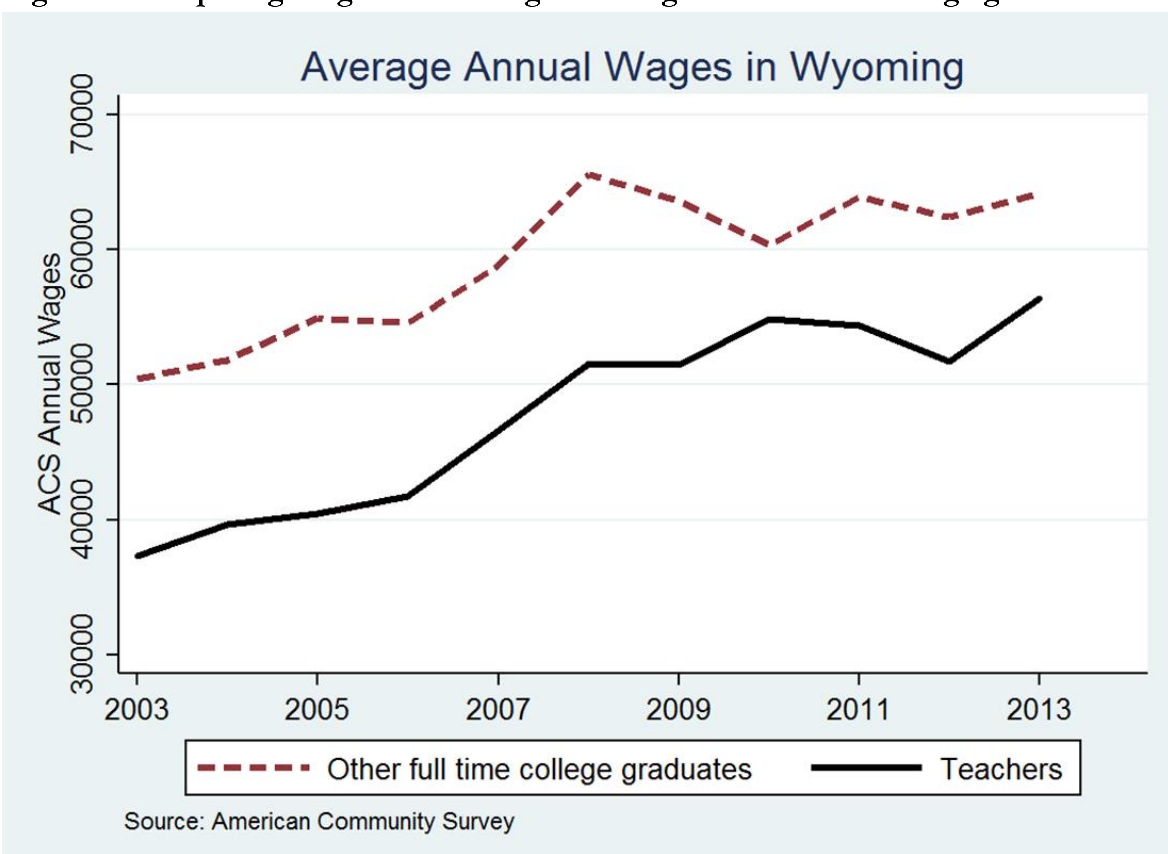


Figure 8 reports the ratio of teaching wages and non-teaching wages after adjusting non-teaching wages. The most appropriate way to make these multiple comparisons simultaneously is to use multivariate regression analysis. Details about these regressions are reported in Appendix C. Based on these regressions, wages for non-teachers are predicted using the average characteristics of teachers. These predictions will adjust the average wages for individuals to mimic the characteristics of teachers. Wages for teachers outside of Wyoming are also adjusted using these regressions to match the characteristics of Wyoming teachers. Like with the results for all professional and technical occupations, Wyoming's ratio of teaching to non-teaching wages far surpasses the average in other neighboring states and in the US as a whole. While teaching wages have eroded relative to wages for similar workers in other states, teaching wages in Wyoming have increased.

Figure 8 first reports the ratios only adjusting for personal characteristics like age and education. **Figure 9** reports the adjustment using weeks of work as well. After adjusting for weeks of work, teachers in most parts of the United States are paid roughly the same as similar non-teachers. In Wyoming, however, they are paid about 22 percent more. **Figure 10** disaggregates the data for individual comparison states.

Figure 8: Comparison of Teacher Wages and Wages of Similar College Graduates

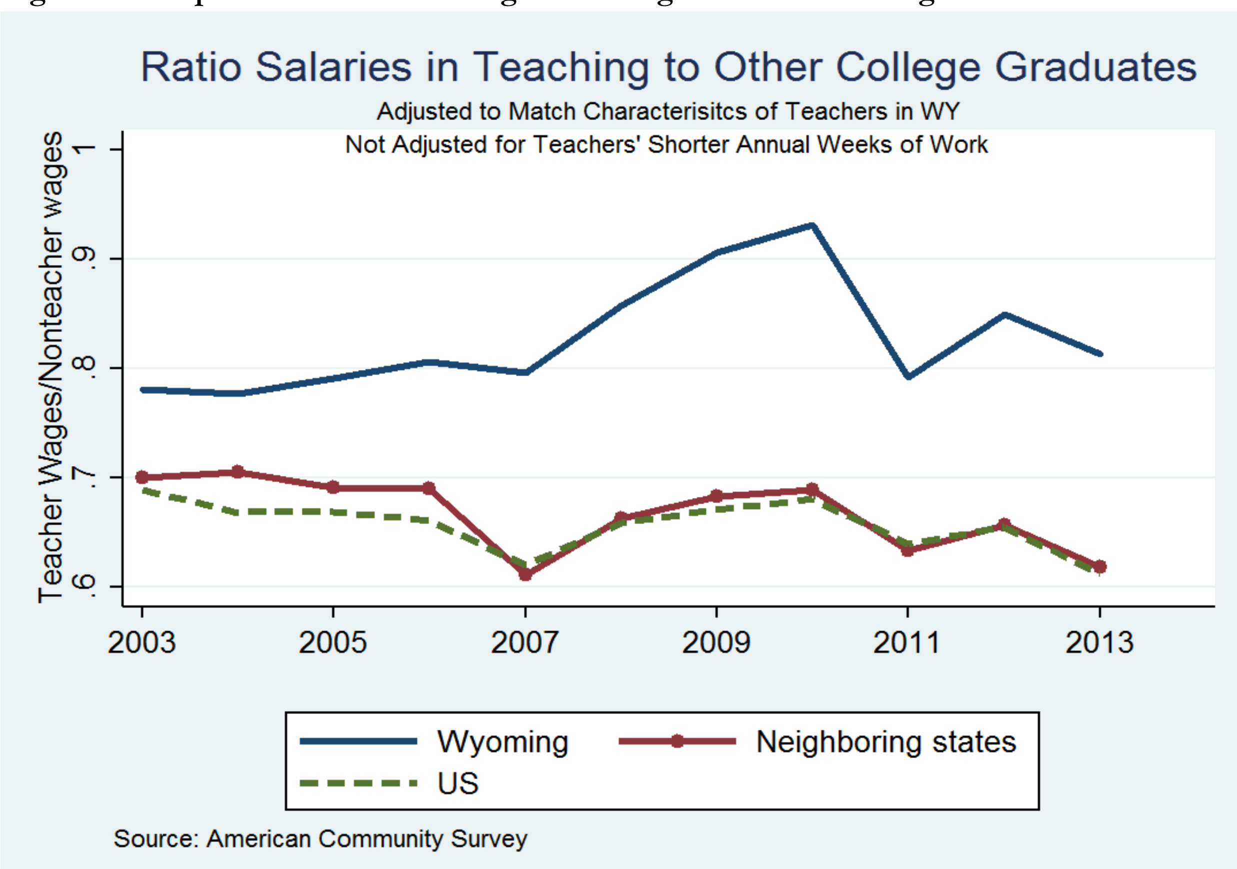


Figure 9: Comparison of Teacher Wages and Wages of Similar College Graduates, Adjusted for Weeks of Work

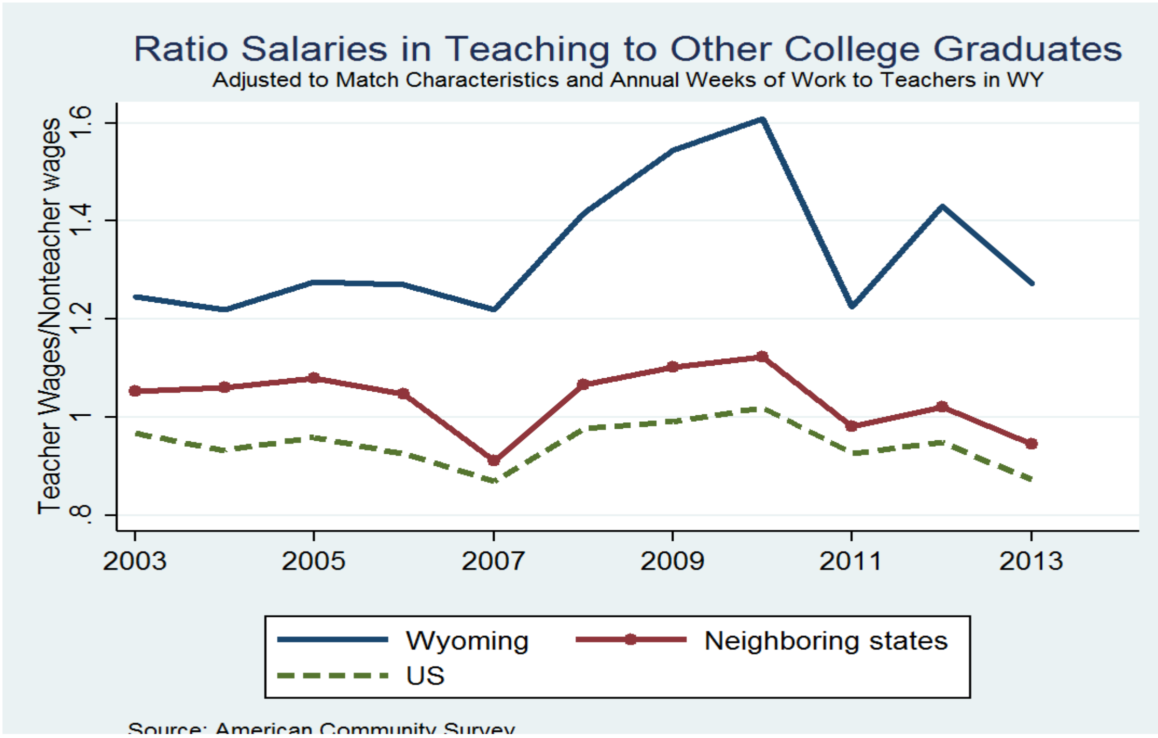
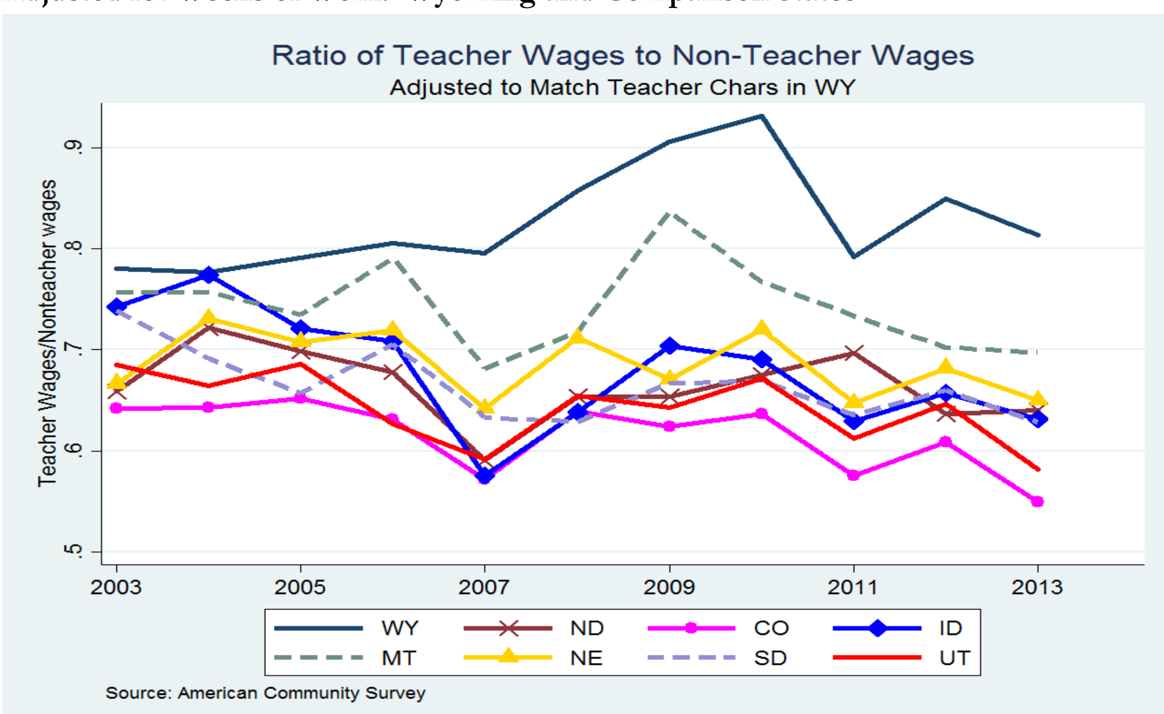


Figure 10: Comparison of Teacher Wages and Wages of Similar College Graduates, Adjusted for Weeks of Work. Wyoming and Comparison States



E. Rankings of Model and Actual Salaries

The previous sections each report a different type of comparison of teaching salaries in Wyoming relative to salaries of other groups. However, regardless of which measure is used, teaching has become very attractive in Wyoming relative to other states. **Table 3** shows the rank of Wyoming across other states based on these various comparisons in the latest year available for each data source. In nearly every instance, Wyoming ranks as one of the top states in terms of relative salaries. For example, comparing only teaching salaries across states, Wyoming ranks 14th. However, since cost-of-living and alternative employment opportunities in Wyoming differ from other states, this comparison is misleading. Non-teaching wages also vary across states because of differences in state characteristics. After comparing the ratio of teaching salaries to the salaries of other professional workers in each state, Wyoming emerges as the state with the highest ratio. When comparing the ratio of teaching salaries to the salaries of other employed college graduates in the state, Wyoming ranks first in the nation. This is true whether or not those salaries are adjusted to match the characteristics of teachers or simply compared to other professionals.

The second and fourth columns use the model salary in Wyoming for the relevant year instead of the actual average salary in Wyoming in that year. If actual salaries had been the same as the model salaries, Wyoming would have ranked in the upper third of US states. It would still be ranked at the very top of the region.

Table 3: Rank of Wyoming Teaching Salary Relative to Other States Based on Comparisons with Alternative Workers

	Teacher wage/ Non-Teacher Wage Professional & Technical Occupations OES data		Teacher wage/Non-Teacher Wage College Graduates, Adjusted for Characteristics ACS Data	
	Actual Average	**Model Average**	**Actual Average**	**Model Average**
2014-15	.92	.80	--	--
Rank in US	1	16	--	--
2013-14	.94	.81	.81	.78
Rank in US	1	12	1	1

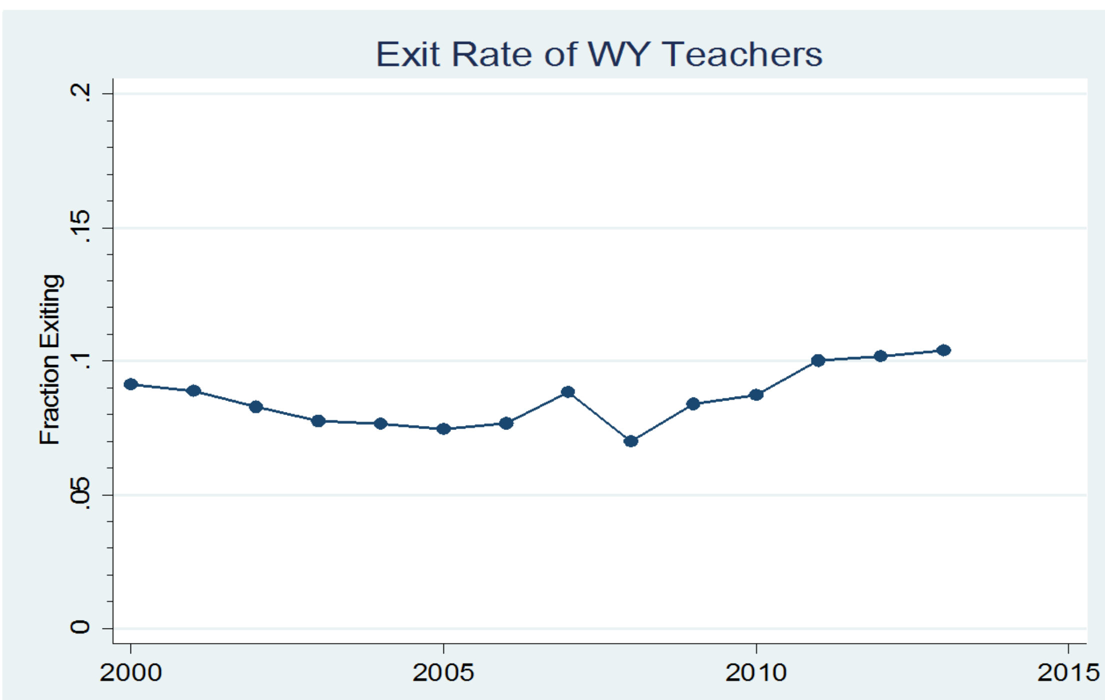
How have rising teacher salaries affected teacher recruitment and retention?

A. Retention: New Teachers, Retirements, and Exits for other Professions

How has the increase in teacher salaries affected recruitment, retention, and teacher quality in Wyoming? This is not a simple question to answer. First, a number of factors beyond salary affect the decision to become or to remain a teacher. Many teachers exit teaching or leave the state for reasons unrelated to the attractiveness of the job, including retirement, the need to care for other family members, or relocation due to spousal job constraints. However, the turnover rates of new teachers in particular are likely to be more sensitive to the relative attractiveness of teaching in Wyoming, and so the analysis below examines both overall turnover rates and the exit rates of new teachers.

Teacher turnover rates are based on the WDE fall staffing files. Full time teachers in the fall staffing files in one year are compared to teachers in the following year. For example, the exit rate for 2013 is the percentage of teachers in October of 2013 who are not teaching in October of 2014. **Figure 11** reports exit rates of full time teachers from Wyoming. Over time, about 10.5 percent of teachers in a given year are no longer teaching in Wyoming in the following year. **Figure 11** also shows that this exit rate has remained relatively constant at between 9.5 percent to 11 percent since 2000, with no marked trend over time.

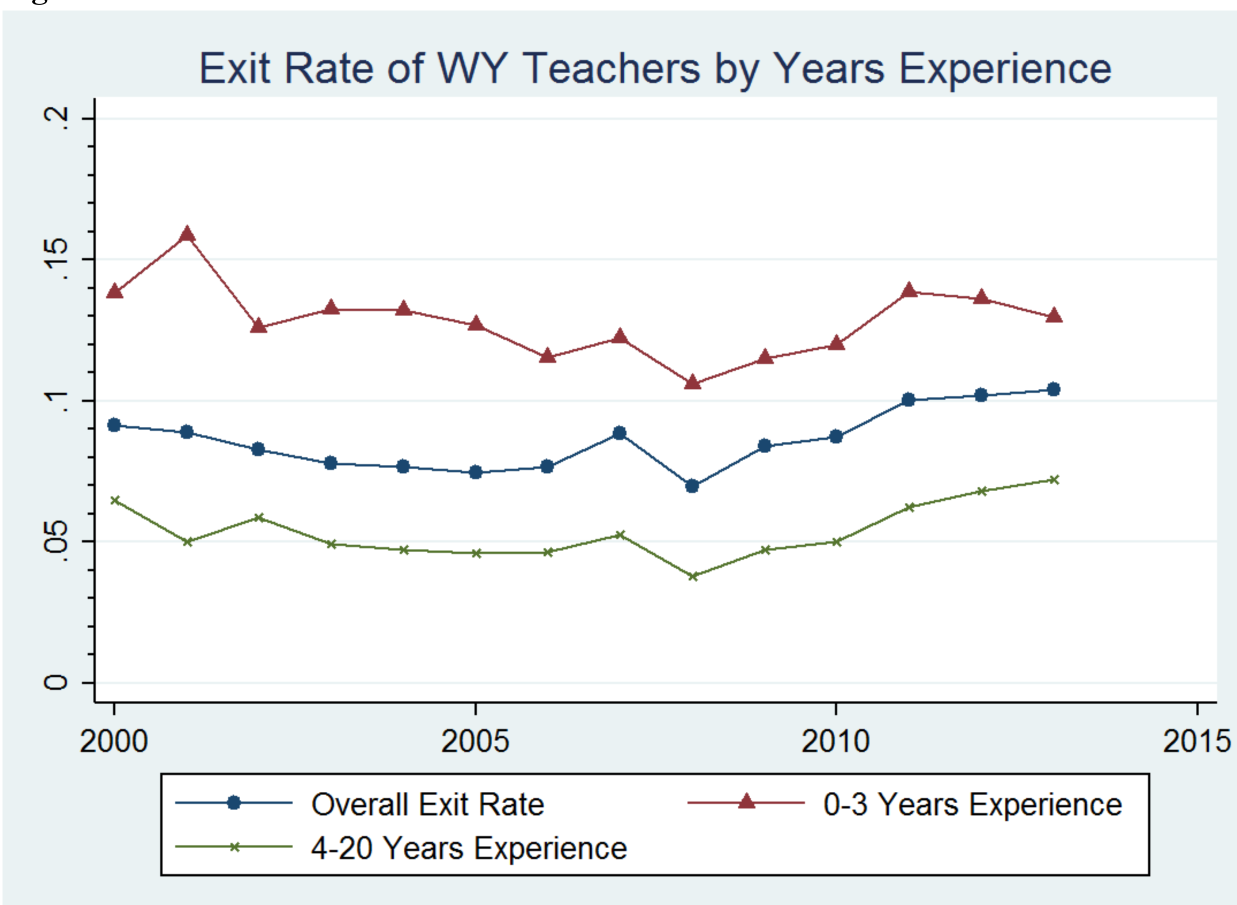
Figure 11: Trends in Teacher Turnover



Source: WY Department of Education Staffing Data, full time teaching assignments.

Some exit is always inevitable—for example, retirements make up a large fraction of exits. The exit of lower quality teachers would potentially be beneficial if they were replaced with higher quality new hires. The exit rate of new teachers is more of a concern as new teachers tend to be associated with lower student achievement in their first three years. In the last two years of available data, about a third of teachers leaving Wyoming schools were close to retirement age (55 or older). On the other hand, about a third of a percent had less than three years of experience. New teachers are likely to be more sensitive to other employment opportunities, as they have acquired little experience on the job. Furthermore, turnover of new teachers is more problematic for schools, as teachers are generally less effective in their first three years of teaching. **Figure 12** reports exit rates for teachers with one to three years of experience and for mid-career teachers.

Figure 12: Exit rate for New and Mid-Career Teachers

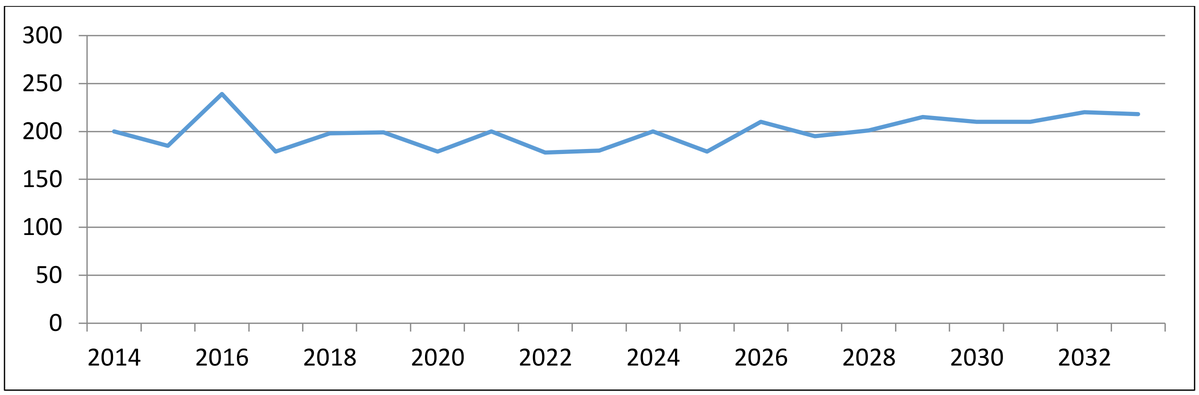


Source: WY Department of Education Staffing Data, full time teaching assignments.

Figure 12 shows turnover rates have remained relatively stable, although there has been a rise from about four percent to about seven percent for mid-career teachers since 2008. Rates for new teachers also had a slight rise, but then have declined in the last two years.

Retirements are a second source of significant turnover. Figure 13 shows the number of individuals projected to become eligible to retire for 2104 through 2033, based on the eligibility rules of the Wyoming Retirement System. Individuals participating in this system whose contracts began before September 1, 2012 are eligible to retire at 60 years of age or when age plus experience is greater than or equal to 85. The number of teachers becoming eligible under this rule is projected to be relatively stable, with an average of about 200 retirements per year. This is somewhat lower than the number of older teachers (ages 55 and older) who have exited teaching over the past three years.

Figure 13: Projected Teachers Becoming Eligible for Retirement (Age 60 or Rule of 85), 2015-2033



Source: Analysis based on WY Department of Education Staffing files (WDE 602)

Because the leading age of the baby-boom has passed through teaching, retirement pressures for the future are expected to be similar to those of the past four years, which is somewhat higher than the retirement pressure was prior to 2007. However, the age profile is beginning to shift towards younger replacements.

Although teaching wages on average appear to be competitive with wages of other occupations, do teachers who exit teaching take more attractive outside offers? The Research and Planning (R&P) Division of the Department of Workforce Services (DWS) has tracked the wages of those who leave teaching in Wyoming. These individuals can be followed if their subsequent employment is covered under the Unemployment Insurance system in Wyoming or in states with data sharing agreements. To increase the sample size and protect the confidentiality of individuals, R&P, DWS pooled data for individuals who exited teaching over the 2011/12 and 2012/13 school years.

Table 4 reports that these individuals generally took a substantial pay cut, on average losing about $23,000. About 30 percent could not be tracked, with many of these likely retiring or leaving the work force. Of those who could be tracked, about 70 percent worked in education services within Wyoming, on average for lower pay. Only seven percent left for employment in another state, whether in teaching or another occupation. The most popular destination occupation outside of Wyoming public schools was employment in another public or social service, like health care, social assistance, or public administration.

Table 4: Destination Occupations and Wages of Wyoming Public School Teaching Exits

	Teaching Contract Wage	Wage in Destination Occupation
Total 2011/12 and 2012/13 Exits (N=1,513)	**$55,308**	**$32,364**
Destination Occupation		
Other public schools, education services in Wyoming (N=750)	$55,354	$32,766
Other public and social services in Wyoming (other education services, health care, social assistance, public administration) (N=161)	$49,526	$34,087
Other occupations in Wyoming (N=79)	$52,608	$27,393
Education services occupations in other states (N=60)	$50,838	$33,529
Other occupations in other states (N=19)	$47,740	$18,884
Destination Unknown (N=444) May have left labor force or moved to state without data sharing agreement	$58,736	--

Source: Research and Planning, Wyoming Department of Workforce Services. Based on Wyoming Department of Education Contract Files (WDE 602) and R&P Wage Records.

B. Recruitment of new teachers

The first section of this report showed that salaries in Wyoming are high relative to other states in the region and relative to other occupations. Has this led to increased recruitment of teachers from other states? Data on this question are hard to come by, as teachers are not tracked across state lines. However, the WDE data for Wyoming includes the undergraduate institution of teachers licensed in Wyoming. This data is matched to the staffing files to identify new full time hires.

Tables 5 and **6** report this in two ways. First, **Table 5** looks at all new hires from 2008 through 2014. Not surprisingly based on the high relative wages, Wyoming remains an attractive destination for teachers educated in other states. Previous reports (Stoddard 2011) showed that from 2000-2003 half of new hires in Wyoming had a first bachelor's degree from Wyoming. **Table 5** shows that in recent years, the proportion is about a third, with generally at least as many coming from adjacent states. This is likely due to the competitive salaries in Wyoming compared to the region.

Table 5: Fraction of Wyoming New Hires, by State where Obtained First Bachelor's Degree

Year	From Wyoming	From Adjacent States	Other States	Unknown
2007-08	39%	32%	18%	11%
2009-10	34	38	23	5
2011-12	37	36	23	4
2013-2014	36	36	26	2

Source: Based on Wyoming Department of Education Contract Files (WDE 602).

Some of these new hires may actually be experienced teachers who earned their BA in another state a number of years ago.

Table 6 restricts attention to new hires who earned a BA in the last four years. Again, Wyoming draws large fractions of these new hires from surrounding states. However, when examining the institutions where Wyoming teachers originate, it does not appear that these institutions have become more selective over time. In fact, the largest change has been the number of institutions that largely serve students online. This is somewhat of a concern, as there is some association between the selectivity of a teacher's undergraduate institution and higher student performance.[3]

[3] For example, see Ballou (1996), Clotfelter, Vigdor and Ladd (2006), Ehrenberg and Brewer (1994), Ferguson and Ladd (1996).

Table 6: Fraction of New BAs from Wyoming and Other States

BA State	Teachers with BA degree earned 2010-2014, Hired 2012-2014	
	Number Employed	**Percent of 2010-2014 Hires**
Total	3,081	100%
Wyoming	1,501	48.7%
South Dakota	266	8.6%
Utah	242	7.9%
Colorado	202	6.6%
Nebraska	189	6.1%
Montana	148	4.8%
North Dakota	138	4.5%
Idaho	72	2.3%
Other states	323	10.5%

BA Institution	Percent of 2010-2014 Hires
University of Wyoming	48.5%
Black Hills State	7.5%
Chadron State	5.1%
West Governors University (online)	3.9%
Regis University (large online component)	3.8%
Valley City State	3.0%
About 2% each from University of Northern Colorado, Utah State	
About 1% each from Brigham Young University Idaho, Grand Canyon University, University of Montana, Montana State University, Bozeman, Montana State University Billings	
Other Universities: 18%	

For reference, **Table 7** reports the fraction of University of Wyoming graduates who are eventually employed in Wyoming.

Table 7: University of Wyoming Teaching Graduates Hired by WY Districts

Year	Number of BAs or Certificates from University of Wyoming	Number employed in 2014/15
13-14	222	83 (37%)
12-13	270	128 (47%)
11-12	283	142 (50%)
10-11	262	130 (50%)
09-10	264	158 (60%)
08-09	239	116 (49%)
07-08	239	123 (51%)

Conclusions

This labor market study finds that teaching salaries in Wyoming are now at very high levels, relative to model salaries, salaries in neighboring states, salaries for other professional occupations, and salaries for other comparable workers in the state. Wyoming is now ranked at the very top of the United States in terms of the relative attractiveness of the teaching profession. While model salaries are somewhat lower than actual salaries, model salaries still exceed average salaries in all comparison states. Relative to the pay of other workers, actual salaries are the highest in the country and model relative salaries rank in the top third of the nation.

However, overall turnover rates have remained relatively unchanged over this period. This may be in part because turnover rates in Wyoming are now very low and are more likely related to retirements and other factors than to salary. Teachers are actively recruited from other states, although the quality of the institutions that teachers come from has not become more selective over time. While there may still be improvements as new positions become available, existing trends suggest little quality responsiveness to the salary increases.

Based on this analysis, Wyoming model salaries are at the top of regional salaries, enabling Wyoming to recruit teachers from many surrounding states and to maintain very low turnover rates. The model funding has enabled school districts to provide salaries that are highly competitive nationally. Wyoming is positioned to allow districts to compete more aggressively for teachers from more selective higher education institutions in the area.

Chapter II

Labor Market for Non-Teachers Employed by K-12 Districts in Wyoming

Executive Summary

This report focuses on indicators related to non-teaching staff positions, documenting the labor market conditions for these positions using metrics that are based on rapidly available data sources that track current conditions. This report focuses on two sets of indicators: comparative average annual wages for related occupations, and trends in turnover rates.

In general, salaries in non-teaching occupations in schools are competitive with other private and state government employers, with school employees typically making higher average annual salaries.

School administrators also appear to be relatively well paid compared to other management occupations, although chief executives and financial managers in the private sector have higher compensation. Principals have higher salaries than general management occupations in both the private sector and other public sector jobs, and salaries in Wyoming for principals exceed those in other states in the region by about 15 percent.

Librarians, social workers, and counselors have significantly higher salaries: the premium relative to annual salaries in other sectors is around 20 percent. Salaries for classified staff positions (janitors, food preparation workers, bus drivers) also tend to be higher than their market counterpoints, as do salaries for aides who make more about 10 percent more than teaching assistants or other personal support occupations. Salaries for psychologists, network administrators, and secretarial and clerical staff are much closer to market salaries. Nurses and speech pathologists are paid less in schools than elsewhere.

These results should all be viewed with the understanding that annual salaries do not reflect different hours and weeks of work or other benefits. On a weekly comparison, salaries in schools exceed salaries in other sectors for nearly every occupation considered.

Turnover rates have been fairly stable across occupational groups since 2002, with rates ranging from 10 to 15 percent for administrators, secretaries and clerical staff, and other professional staff. However, rates for aides and classified staff have shown a five percentage point rise since 2008. Turnover rates are roughly comparable with those for state government employees, and are lower than the rates in many other industries.

Data Sources and Classification of Non-Teaching Occupations

The indicators presented below compare salary or turnover rates for elementary and secondary school employees with private sector or state government employees. The principal data used come from the Wyoming Department of Workforce Services (DWS), which conducts a variety of surveys of employers in Wyoming. The primary data source used for the wage comparisons is the Occupational Employment Statistics (OES) Survey. This is a survey conducted of a sample of employers in Wyoming each quarter. The May results report mean wages by occupation. For this report, the DWS provided disaggregated results for (1) Elementary and Secondary schools in the local government sector (NAIS code 6111), (2) All private sector employees, and (3) State and local government employees. The OES is a sample of employers, so the specific employers that appear in the survey each year differ. Because these results are for occupational classifications and sampling differences in employers occur each year, comparisons over time are less appropriate to make.

Non-teaching positions in the Occupational Employment Statistics survey (OES) are coded using Bureau of Labor Statistics Standard Occupation Classification (SOC) codes. These codes first provide a two-digit general occupational group (for example, “Management Occupations,” “Community and Social Service Occupations,” or “Healthcare Practitioners and Technical Occupations”). The SOC codes used also include a second four-digit code that specifies a narrower occupation (for example, “Education Administrators--Elementary and Secondary School” or “Registered Nurses”).

The tables reported in the body of this report include both the larger occupation groups and the narrower selected specific occupations that include many individuals employed by elementary and secondary schools. The full list of OES occupations included in elementary and secondary schools as reported by the DWS is included in Appendix D, along with the number of employees sampled in each occupation. Missing cells in this table indicate that there were not enough individuals in the occupation to report the salary information.

The turnover statistics by occupation come from the Fall Staffing files from the Wyoming of Education (WDE). The data include all individuals (1) Who do not have a teaching assignment as part of their positions, and (2) Who have a position with at least FTE .50.

In order to have large enough groups for statistically valid comparisons, assignment codes listed in the WDE staffing files were grouped into categories to facilitate comparisons with the relevant markets and to calculate turnover rates. Occupations were grouped based on several factors: (1) Positions with the same Wyoming model funding salary were always aggregated, (2) WDE assigned “employee class” as well as the WDE general headings indicating the nature of the assignment, and (3) Positions with similar levels of required education (e.g., college degree required, license or certification required) were grouped.

The following occupational groups were used with the WDE staffing files:

1. **School and Central Administration**
   This includes the assignment codes of Principal, Assistant Principal, Superintendent, Assistant Superintendent, and Business Manager. Each of these positions is associated with a specific salary in the Wyoming funding model.

2. **Professional Staff**
   This includes many of the occupations that require a college degree. These include all licensed or certified positions, all of which are funded using the teacher salary in the funding model. Licensed or Certified professionals include Librarians, Counselors, Psychologists, Social Workers, and Nurses. The Professional staff category also includes Library and Media Technicians, who are also listed as Computer Technicians. Finally, this category includes all positions classified by the WDE with an employee class of "Administration" but that are not included in the above category. These include positions like Special Education Director and Human Resource Director, for example.

3. **Secretary/Clerical Staff**
   This category includes all positions coded as Secretary/Clerical by the WDE. This includes the funding model categories of School Secretary, School Clerical, Central Office Secretary, as well as a number of other secretarial and clerical positions.

4. **Other Classified Staff**
   This occupation group includes all remaining classified positions, with the exception of supervisory aides. This group aggregates all Operations and Maintenance positions (Custodians, Groundskeepers, Maintenance), Food Service, Transportation, Other Classified Student Support positions.

5. **Supervisory Aides**
   Supervisory Aides include all regular Special Education aides, including Instructional, Student support, Playground, Library/Media, Special Education, Title I, and Transportation, among others.

How Do Salaries in K-12 Schools Compare to Market Salaries for Non-Teachers?

In many ways, monitoring market pressures on non-teaching staff salaries is less difficult than monitoring teaching salary pressures. Teachers have few exact private sector counterpart occupations, and leaving the public school teaching profession generally means choosing a different career. In contrast, many of the staff positions in schools do have counterparts in other industries, allowing easier transitions to a different employer and thereby allowing for more precise measures of specific market pressures.

However, there are still a number of differences between non-teaching positions in elementary and secondary schools and their counterpart positions for other employers.

- First, the **contract hours worked differ across the sectors.** Elementary and secondary school have nine-month contracts for a number of positions. As a result, some of the comparisons include both monthly and annual salary comparisons for positions in public schools that are typically on 10 month contract. According to the Bureau of Labor Statistics, salaried professional workers typically receive eight paid holidays and two to three weeks of paid vacation depending on the length of service.[4] Accordingly, the analysis uses 37 weeks of work for teachers and related occupations and 47 weeks of work for non-school employers.
- Second, **retirement and health benefits** are typically more generous than those for many private employers. However, little information is available for benefits comparisons across occupations.
- Third, even similar **occupational titles may involve significantly different duties** in another sector—for example, chief executives or computer technicians for private employers may have a substantially different scope of activities than their counterparts in elementary and secondary schools.
- Finally, the **data sources used in this report do not report age or work experience**, leading to potentially different wages due to other factors than simply market differences.

With these caveats in mind, **Tables 1** through **5** present the latest comparisons between salaries in public schools, private sector employees, and state government employees.

[4] For details, see Bureau of Labor Statistics "Paid leave in private industry over the past 20 years," *Beyond the Numbers: Pay and Benefits Bulletin*, August 2013, Vol 2. No. 18. http://www.bls.gov/opub/btn/volume-2/paid-leave-in-private-industry-over-the-past-20-years.htm Accessed on Sept. 15, 2015

Category 1: Administrative Positions

Table 1 reports the average annual salary for Administrators. This table makes several comparisons. The first column in the top panel reports the average salary that would be generated by the funding model—that is, taking the experience and education of each administrator, it computes the model salary for that individual and averages across all administrators. The second column reports the actual average salary as paid by districts.

The bottom panel shows that average administrator and management salaries reported in the Occupational Employment Statistics. These compare salaries for given occupational classifications in public schools, private employers, and other public employers.

Table 1: K-12 Administrative Positions

Model Title	Funding Model Weighted Average Salary (2014-15)	Actual Average Salary WDE Files (2014-15)	
Superintendent	$112,820	$136,922	
Assistant Superintendent	$89,865	$131,248	
Business Manager	$76,749	$93,321	
Principals	$85,856	$95,134	
Assistant Principals	$72,037	$88,792	
OES Data			
OES Occupation Title	**K-12 Schools, Local Government**	**Private Industry**	**State and Other Local Employers**
All Management Occupations	$96,466	$92,290	$81,684
Chief Executives	$129,050	$152,430	$115,880
General/Operations Managers	$119,020	$101,730	$91,674
Financial Manager	$93,710	$108,620	$83,230
Education Administrator, Elem./Sec. School	$93,490	--	--

Source: WY Department of Workforce Services provided analysis of Occupation Employment Statistics Survey, May 2014. Funding Model Weighted Average Salaries from Continued Review of Educational

Resources in Wyoming, 2014 and author's calculations. Model weighted average salaries are adjusted to reflect predicted model salary based on experience, education, and RCA.

Table 1 shows that actual salaries exceed model salaries by about 20 percent for central administrators, and by about 10 percent higher for school administrators (principals and assistant principals). The OES surveyed salaries are in line with those reported by the WDE.

The bottom panel shows that management salaries in public schools in general exceed those in private industry by about $4,000 and other public employers by about $15,000. Salaries for superintendents and financial managers tend to be lower than their counterparts in the private sector but above those in the public sector. Obviously, there is not an exact counterpart for school principals in other industries, but principal salaries also exceed salaries for management occupations on average. Note that this does not adjust for weeks of work. Typically, school principals work about 10 months a year, or 43 weeks, as compared with a minimum of 47 weeks for other administrators.

Table 2 compares the salaries of elementary and secondary school principals in Wyoming with other states in the region, as reported in the OES. As with teachers, Wyoming salaries for principals are well above those of all other states in the region. Wyoming ranks 16th in the nation for salaries for principals, up from 20th in 2009. Salaries are about 15 percent higher than the average for other principals in the region, and are about three percent higher than the next highest regional state (Nebraska).

Table 2: Elementary and Secondary School Administrator Salaries, Wyoming and Comparison States, OES 2009 and 2014

Elementary and Secondary School Administrators	May 2009	May 2014
WY Funding Model Weighted Average Salary		$85,856 Rank = 27
WY actual	$86,030 Rank = 20	$93,370 Rank = 16
CO	$79,310	$84,370
ID	$73,240	$78,880
MT	$65,120	$74,320
ND	$70,960	$84,710
NE	$80,950	$90,490
SD	$65,590	$74,900
UT	$78,940	$85,960

Source: Occupation Employment Statistics Survey, May 2014.

Category 2: Professional Staff

Table 3 reports salaries for professional occupations. Most require a college degree and many additionally require certification or a license. Except for computer technicians, the other professional occupations reported below all have model salaries equivalent to teachers.

Weeks of work are particularly different across sectors for professional workers. Assuming 185 contract days, this translates into 37 weeks of work a year. The numbers in parentheses represent weekly wages, with the conservative assumption that non-school employees work 47 weeks a year.[5]

Table 3: Average Annual and Weekly Salaries for Professional Staff Positions, 2014

OES Occupation Title	K-12 Schools OES	Private Sector OES	State and other local Government OES
Clinical, Counseling, School Psychologists	$69,580 annual ($1,880/week)	$73,760 annual ($1,569/week)	$69,300 annual ($1,474/week)
Child, Family, and School Social Workers	$61,580 annual ($1,664/week)	$40,730 annual ($867/week)	$56,410 annual ($1,200/week)
Educational, Vocational, School Counselors	$62,880 annual ($1,699/week)	--	$53,266 annual ($1,133/week)
Mental Health counselors	--	$52,810 annual ($1,124/week)	--
Registered Nurses	$51,460 annual ($1,391/week)	$57,340 annual ($1,220/week)	$63,683 annual ($1,355/week)
Speech Pathologists	$64,490 annual ($1,743/week)	$74,090 annual ($1,576/week)	$77,690 annual ($1,653/week)
Librarians	$59,520 annual ($1,609/week)	--	$45,433 annual ($967/week)
Network and Computer System Administrators	$61,840 annual ($1,671/week)	$62,170 annual ($1,323/week)	

Source: Occupation Employment Statistics Survey, May 2014.

Table 3 shows that for psychologists and counselors, salaries are comparable between elementary and secondary schools and other public sector jobs. Private sector jobs tend to be either higher paid (in the case of psychologists), or lower paid (in the case of social workers and mental

[5] For details, see Bureau of Labor Statistics "Paid leave in private industry over the past 20 years," *Beyond the Numbers: Pay and Benefits Bulletin*, August 2013, Vol 2. No. 18. http://www.bls.gov/opub/btn/volume-2/paid-leave-in-private-industry-over-the-past-20-years.htm Accessed on Sept. 15, 2015

health counselors), although this is likely because the occupations in those sectors are more sharply delineated.

Nurses and speech pathologists, on the other hand, have lower salaries in the schools. Librarians tend to be higher paid, and computer technicians tend to have comparable salaries. However, for all occupations, comparisons of weekly wages put salaries in schools above those for private sector and other public sector workers.

Category 3: Secretarial and Clerical Positions

Table 4 reports secretary and clerical salaries. Secretarial and clerical positions are probably among some of the positions with the cleanest market counterparts, although contract hours differ between schools and other employers. Central office and school secretaries work 2080 hours, representing full time, full year work. School clerical staff have 1600 contract hours, representing 40 weeks of work. These are again compared to non-school employees with 47 weeks of work.

Average salaries are about $1,000 more than model salaries. Actual salaries are close to market salaries for most of these positions. The only exception is secretaries, where school secretary salaries exceed salaries in both the public and private sector. Clerks have salaries that are close to market values in annual terms, but their shorter weeks of work produce significantly higher weekly salaries.

Table 4: Average Annual Salaries for Secretarial and Clerical Positions, 2014

Funding Model Weighted Average Salary		$32,863	
District Average Actual Salary in WDE files		$33,979	
OES Title	**K-12 Schools**	**Private Sector**	**State Government**
Clerks: Bookkeeping/ Accounting/Auditing	$39,360	$36,420	$40,215
Executive Secretaries and Admin. Assistants	$45,630	$45,650	$45,373
Secretaries, (Not Legal, Medical, Exec.)	$37,480	$32,660	$36,095
Office Clerks, General	$31,840 annual ($796/week)	$31,530 annual ($670/week)	$30,874 annual ($656/week)

Source: WY Department of Workforce Services provided analysis of Occupation Employment Statistics Survey, May 2014. Funding Model Weighted Average Salaries from Continued Review of Educational Resources in Wyoming, 2014 and author's calculations. Model weighted average salaries are adjusted to reflect predicted model salary based on experience, education, and RCA.

Category 4: Other Classified Staff Positions

Schools employ a number of other classified staff. **Table 5** shows that these classified school employees tend to make substantially more than their non-school counterparts, both in the private sector and in other public sector jobs. The only exception is "Maintenance and Repair Workers," who are paid more than other public sector employees but less than in the private sector. However, note that schools typically hire private contractors for more specialized repaid work; these workers are probably relatively highly skilled and are more likely to be employed in the private sector.

Operations and maintenance staff work the full calendar year, although food preparation and bus drivers work the 185 school contract days. As with the other tables, this table assumes that non-school employees work 47 weeks a year, however for many of these types of positions, it is likely that weeks of work are higher than for professional salaried positions.

Table 5: Average Annual Salaries for Other Classified Staff Positions, 2014

Funding Model Weighted Average Salary for operations and maintenance staff		$32,810	
District Average Actual Salary for Operations and Maintenance staff in WDE files		$35,331	
OES Title	**K-12 Schools**	**Private Sector**	**State Government**
Janitors and Cleaners (Not Maids/Housekeeping)	$32,370	$26,310	$28,369
Maintenance and Repair Workers, General	$39,620	$43,400	$38,457
All Food Prep/Serving	$29,141 annual ($788/week)	$20,997 annual ($447/week)	$25,749 annual ($548/week)
Bus Drivers, School or Special Client	$32,520 annual ($879/week)	$26,990 annual ($574/week)	--
Bus Drivers, Transit and Intercity	--	$34,390 ($731/week)	$29,830 ($635/week)

Source: WY Department of Workforce Services provided analysis of Occupation Employment Statistics Survey, May 2014. Funding Model Weighted Average Salaries from Continued Review of Educational Resources in Wyoming, 2014 and author's calculations. Model weighted average salaries are adjusted to reflect predicted model salary based on experience, education, and RCA.

Category 5: Supervisory Aides

The final job category in the model is "Supervisory Aides." In the model, Supervisory Aides are not instructional aides—that is, they are playground monitors, lunchroom monitors, and others who provide supervision rather than instruction. The model also provides funding for tutors—licensed teachers who provide additional instruction.

However, it appears from the hiring data that most school districts hire some form of instructional aides—positions may provide both supervision and classroom support.

This occupation does not have an exact counterpart in the OES data. The occupational group to which Supervisory Aides, instructional aides, and other student support workers below is "Teaching Assistants" in the OES survey. However, it appears that these aides are paid about $22,587 by districts, as compared to $19,906 in the model. In the OES data, "Teaching Assistants" are paid $28,500, implying that OES classifications and the WDE classifications are not well aligned.

However, aides do not have very clear private sector counterparts, and there were few positions listed for state employees that parallel this job. In contrast to the 3,500 teaching assistants reported by schools in the OES survey, there were only about 300 teaching assistants in the private sector. This occupation also tends to require a less specialized skill set. **Table 6** therefore also reports a few other occupations that require a similar level of training and similar expertise to enable richer comparisons.

Again, private sector counterparts typically work more weeks per year than teacher assistants. However, because these occupations are so diverse, weekly wages are not reported.

Table 6: Average Annual Salaries for Supervisory Aides and Support Occupations, 2014

OES title	K-12 Schools	Private Sector
Teacher Assistants	$28,500	$22,110
Other Service Occupations		
Child Care Workers		$21,840
Personal and Home Care Aides		$ 21,740
Healthcare Support Occupations		$30,030

Source: Occupation Employment Statistics Survey, May 2014.

How do Turnover Rates Compare for Non-Teaching Occupations?

As with teachers, there is a second way to think about how competitive occupations in schools are with the broader labor market. Instead of looking just at salaries, this second set of indicators examines turnover rates. These rates will reflect the difficulty schools have in retaining individuals in these non-teaching positions. Rising turnover rates can signal that districts have more positions to fill and also that compensation may not be attractive enough to retain individuals in elementary and secondary school employment.

Figures 1 through **6** present turnover rates for the occupational groups delineated above. Turnover rates are defined as the proportion of individuals in a given occupational class who are no longer employed in that class by the same district in the subsequent year. Turnover rates are calculated by including only individuals without a teaching component to their job to abstract from any influence of the teaching labor market. Only positions with at least .50 FTE are included. This is because the coding of many positions with small associated FTE (e.g., advisor) does not appear to be true turnover, but simply reflects temporary assignments. Turnover rates for individuals who are employed part time (<.50 FTE) are also likely to belong to a different market segment.

Individuals are not counted as exiting even if their assignment code changes, as long as the overall class of employment (e.g., aide, administration) remains the same. For example, if Jane is an assistant principal this year, and next year chooses to become a teacher, she is counted in the exit rate for administrators. However, if she instead becomes the principal next year, this is counted as continuous employment in the same occupational class as she remained an administrator, and she is not counted as an exit.

Each figure includes two series. The first is turnover rate of all employees in that class. The second is the turnover rate of new hires—individuals not employed in that district in the previous year. This second turnover rate is reported because exits of new hires represent higher training costs--brand new hires require more district time and resources to achieve high productivity in their jobs. New hires are also more likely to be of the same age, and exits are not likely to be related to retirement.

Turnover Rates Within Elementary and Secondary Schools by Occupational Group

The figures below largely show that turnover rates have remained roughly constant since 2002, with a slight rise since 2008. In general, exit rates of new hires are higher than the overall exit rate, which is to be expected as new hires are discovering whether the position is a good match. Exit rates tend to be highest for aides and non-teaching classified staff. They are lowest for teachers, administrators, and office support staff.

For both supervisory aides and other classified staff, exit rates do show a steady increase since 2008. About 10 to 15 percent of these workers in 2002 had exited these positions one year later. Exit rates in 2013 were about five percentage points higher.

Figure 1: Annual Exit Rates Across Occupations in K-12 Schools

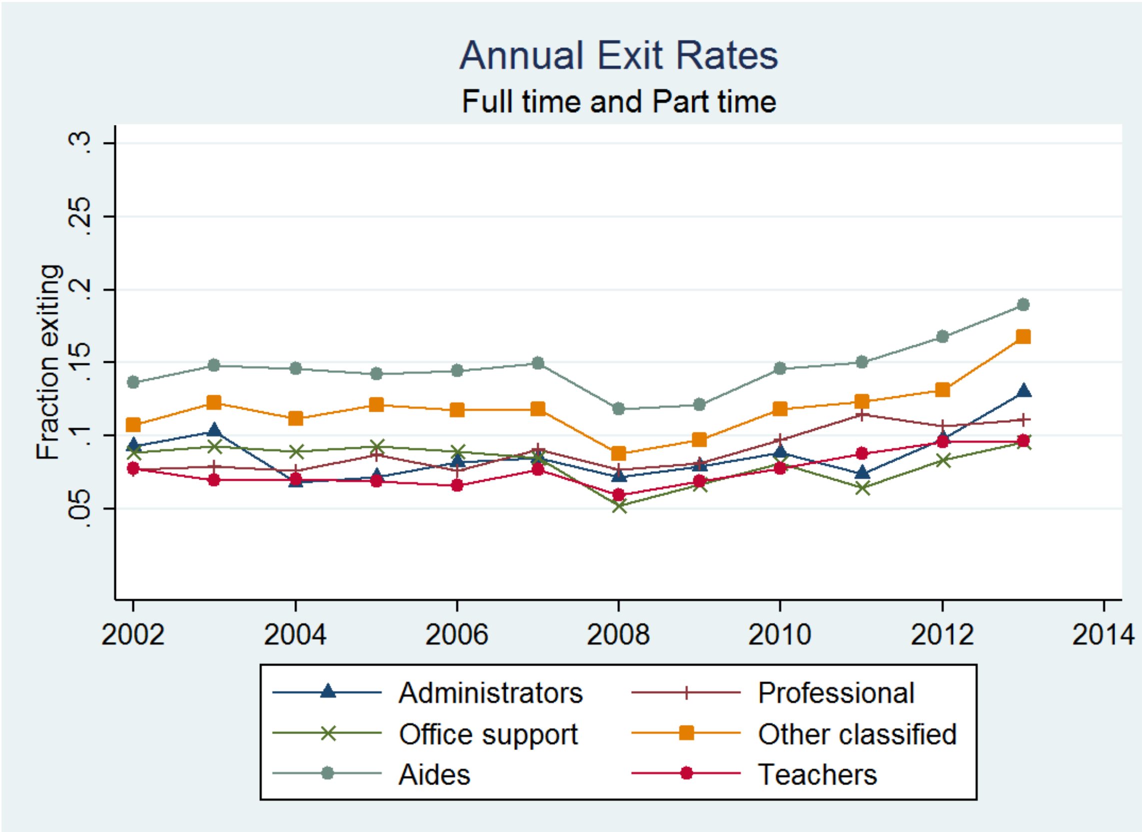


Figure 2: Annual Exit Rate for School and District Administrators

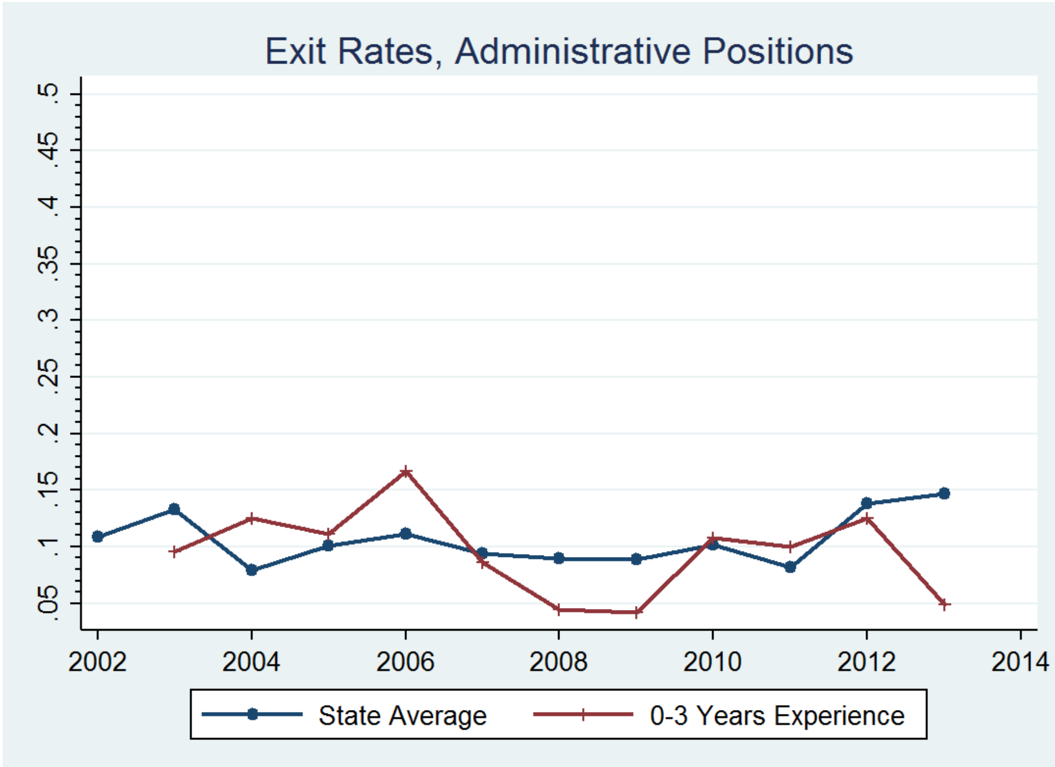


Figure 3: Annual Exit Rate for Professional Staff Positions

Figure 4: Annual Exit Rate for Secretaries and Clerical Staff Positions

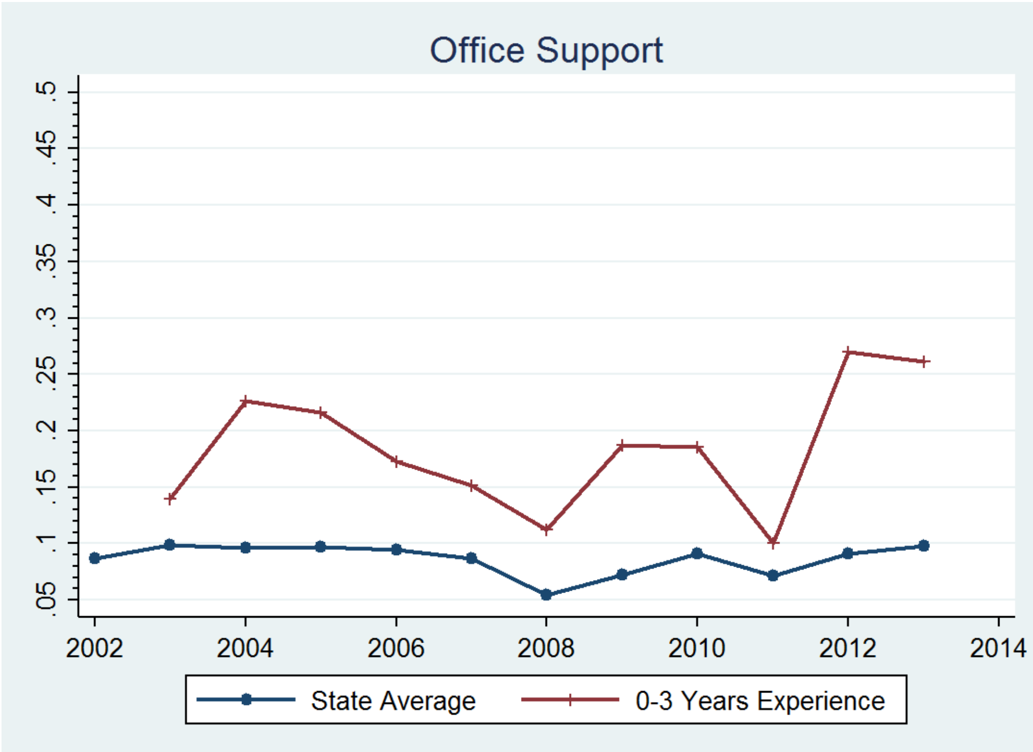


Figure 5: Annual Exit Rate for Maintenance and Operations, Food Service, Transportation, and Other Classified Staff

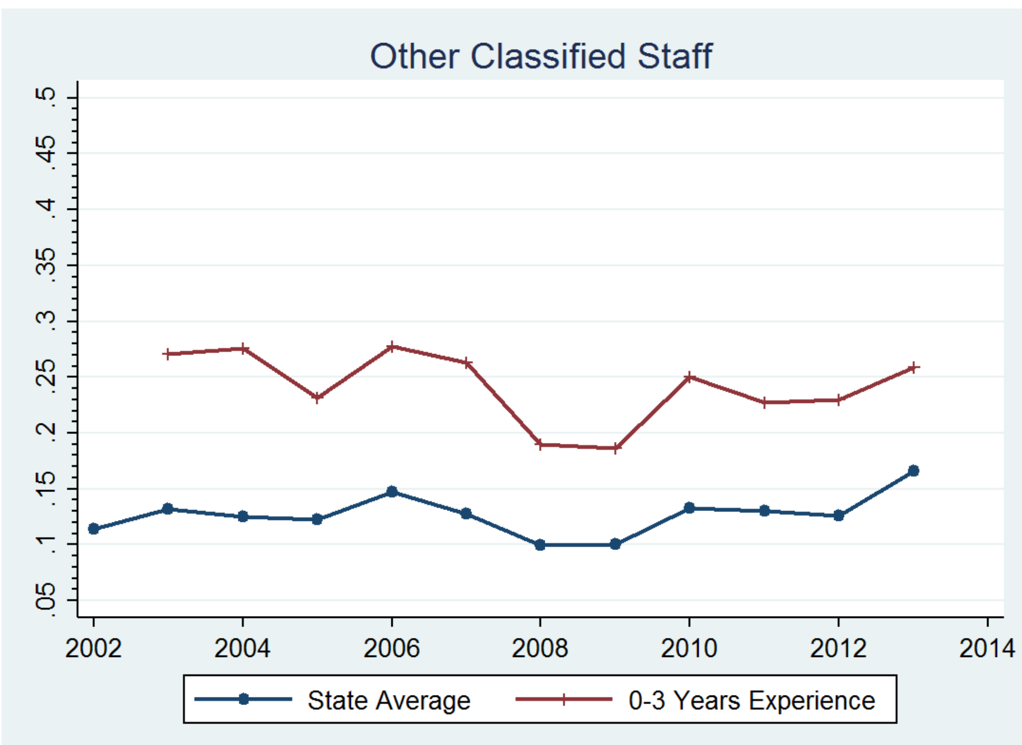
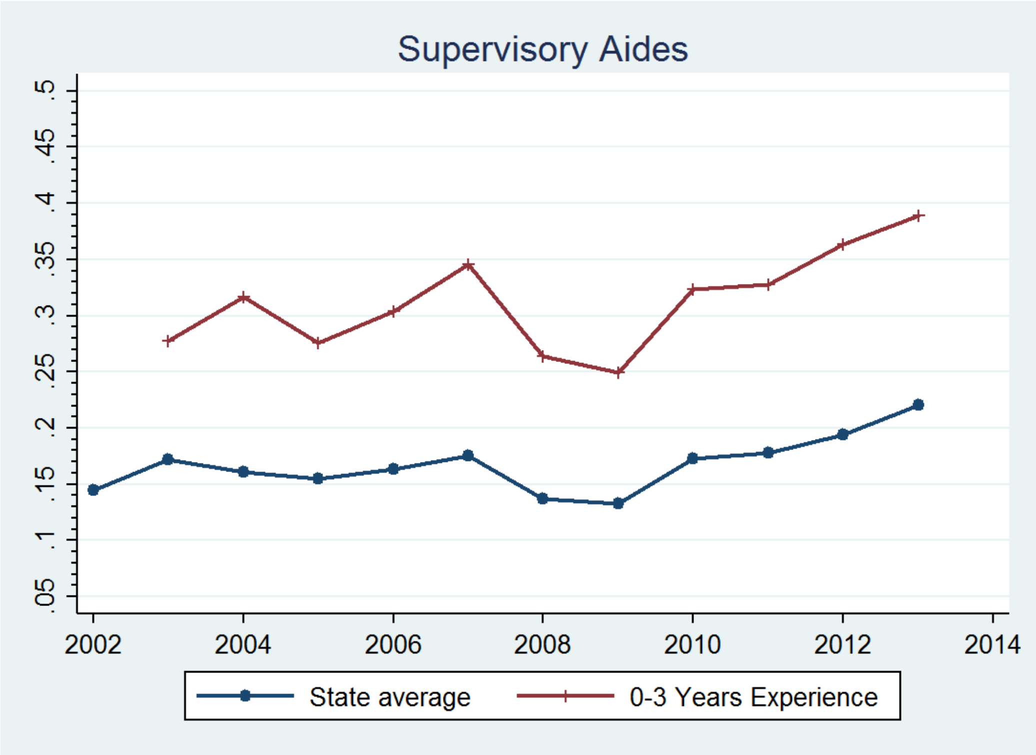


Figure 6: Annual Exit Rate for Supervisory Aides



Comparing Turnover Rates for Education and Other Industries

It is difficult to compare turnover rates for school employees with other occupations, as the data sources and methodologies used are substantially different. However, to put these turnover statistics into perspective, it is useful to present a few comparisons outside of education.

Table 7 reports the quarterly industry turnover statistics calculated by industry by the Wyoming DWS for two quarters in 2010. The industries most related to education are reported: manufacturing, mining, agriculture, and other similar industries are not included because the labor markets are less related. These turnover statistics are calculated each quarter. The calculation includes the sum of the number of individuals newly hired, the number of individuals who exited, and the number of individuals who were both hired and exited in the same quarter. This is divided by the total number of positions in the sample to generate the turnover rate. This calculation is somewhat complicated for schools because of the school calendar. As a result, **Table 7** reports turnover for 2 quarters, in the middle and at the beginning of the school year.

Table 7: Industry Turnover Rates, 2010

Industry	Turnover, Q1	Turnover,Q3
Education Services	11.6	18.5
All Industries	21.7	32.2
Retail Trade	22.6	36.0
Information	15.5	19.4
Financial Activities	17.2	20.8
Professional and Business Services	30.7	40.6
Health Services	17.3	22.1
Leisure and Hospitality	35.5	51.0
Public Administration	10.5	20.1

Table 7 also shows that the "Education Services" industry, which includes higher education as well as elementary and secondary schools, has some of the lowest turnover of any industry. It is roughly comparable to Public Administration, confirming the results about that state government employees and school employees have similar turnover behavior.

Conclusions

- Funding model salaries for the **highest level administrators** are low compared with their counterparts in the private sector and other public sector jobs. Actual salaries for superintendents, assistant superintendents, and business managers are in line with the market, but these salaries exceed model salaries by about 20 percent.

- Similarly, actual salaries for **principals** appear to be closer to market, both in comparison with other management occupations and within the region. Actual salaries place principals at 3 percent higher pay than the next highest paid state in the area. However, model salaries for principals are significantly lower, ranking in the middle of the distribution of neighboring states and in the bottom half of the US.

- Salaries for **other professional staff** are in line with the market. This is particularly true when adjusting for weeks of work.

- **Secretarial and clerical workers** are paid slightly more than the model predicts, but the discrepancy is much smaller than for administrative positions. Actual salaries are in line with the market.

- **Other classified staff** positions are paid highly relative to market. This is true for both model salaries and actual salaries, and there is a particularly large premium when adjusting for weeks of work.

- Comparisons for **aides** are the most difficult to make, as most school districts make hiring decisions that are significantly different from the model recommendations. Most districts hire individuals who act as instructional aides, rather than only supervisory aides. There are also not clear counterparts to these positions outside of K-12 schools, but relative to other support services occupations, these workers are highly paid.

Appendix A: Data Sources

- The Wyoming department of education staffing files report salaries for all teachers in Wyoming, along with details about their experience level, assignment type, and FTE. These files are merged with school level characteristics reported in the Common Core of Data to identify teachers working in small schools, rural schools, or schools with varying levels of student minorities.
- The Digest of Education Statistics (DES) reports average teaching salaries for all states over time.
- The American Community Survey (ACS) is conducted by the US Census Bureau. It is essentially a mini-census conducted in each year since 2000. This is a survey of individuals, and reports an individual's occupation, salary from employment, age, education, race, gender, hours and weeks of work. This survey is used to adjust salaries of non-teachers and teachers in others states to match the characteristics of teachers in Wyoming.
- The Occupational Employment Statistics survey (OES) This is a quarterly survey conducted by the Bureau of Labor Statistics of employers who are paid wage or salary income. Self employed individuals, owners and partners in unincorporated firms, and household workers are not included in this survey. This survey reports the number of individuals in each occupation in each state and the average salary.

Appendix B: Comparable Professional and Technical Occupations

Teacher salaries reported in the Occupational Employment Statistics are compared to the salaries of other professional and technical occupations. These include occupation in the following categories:

- Management Occupations
- Business and Financial Operations Occupations
- Computer and Mathematical Science Occupations
- Architecture and Engineering Occupations
- Life, Physical, and Social Science Occupations
- Community and Social Services Occupations
- Legal Occupations
- Education, Training and Library Occupations
- Arts, Design, Entertainment, Sports, and Media Occupations
- Healthcare Practitioner and Technical Occupations

Teachers are not compared to employees in other occupations. The excluded occupational categories are

- Personal Care and Service Occupations Healthcare Support Occupations
- Protective Service Occupations
- Food Preparation and Serving Related Occupations
- Building and Grounds Cleaning and Maintenance Occupations
- Sales and Related Occupations
- Office and Administrative Support Occupations
- Farming, Fishing, and Forestry Occupations
- Construction and Extraction Occupations
- Installation, Maintenance, and Repair Occupations
- Production Occupations
- Transportation and Material Moving Occupations
- Military Specific Occupations (not surveyed in OES)

Appendix C: Estimating Comparable Non-Teaching Wages

Teaching wages are compared to the wages of non-teachers using the American Community Survey. To make this comparison, the analysis used ACS data from 2001 through 2013. The sample was restricted to all employed individuals with a bachelor's degree between the ages of 22 and 65 who were employed at least 27 weeks in the year and usually worked at least 35 hours a week. Individuals living in group quarters were dropped. Self-employed individuals were also dropped. Teachers were defined as those working in the public sector. Individuals in each survey year reported their income from salary and wages for the previous year.

Separate regressions were run for teachers and non-teachers. These regression included age, age squared, an indicator variable for female, an indicator variables for race, an indicator for whether or not the individual was enrolled in school, an indicator variable for whether or not the individual held an advanced degree, and usual hours worked, and indicators for categories of hours of work and weeks of work. These categories were for working 35 to 48 hours, 49-59 hours, or 60 or more hours a week; and working 27-39 weeks a year, 40-47 weeks a year, 48-49 weeks a year, or 50-52 weeks a year.

The analysis then calculated the average characteristics of teachers in Wyoming in each year. The comparable non-teaching wage was then calculated by predicting wages using the average characteristics of Wyoming teachers. Teaching wages in other states were similarly adjusted.

Appendix D: Occupation Employment Statistics Survey, May 2014

SOC Code	Occupation Title	Elementary and Secondary Schools (NAIS 6111) Number in Survey	Elementary and Secondary Schools (NAIS 6111) Mean Annual Earnings	Private ownership All-Industries May 2010 Number in Survey	Private ownership All-Industries May 2010 Mean Annual Earnings	State Government All-Industries May 2010 Number in Survey	State Government All-Industries May 2010 Mean Annual Earnings
Management Occupations							
11-1011	Chief Executives	40	$129,050	80	$152,430	--	$115,880
11-1021	General and Operations Managers	60	$119,020	4,870	$101,730	370	$91,674
11-3031	Financial Managers	60	$93,710	430	$108,620	100	$83,230
11-9032	Education Administrators, Elem. and Secondary School	440	$93,490				
Computer and Mathematical Occupations							
15-1142	Network and Computer Systems Administrators	70	$61,840	240	$62,170	--	$61,490
15-1150	Computer User Support Specialists	60	$45,970	230	$43,930	90	$48,070
Life, Physical, and Social Science Occupations							
19-3031	Clinical, Counseling, and School Psychologists	130	$69,580	100	$73,760	10	$69,300
Community and Social Services Occupations							
21-1012	Educational, Vocational, and School Counselors	340	$62,880	10	$41,460	110	$53,266
21-1021	Child, Family, and School Social Workers	130	$61,580	310	$40,730	--	$56,410
Education, Training, and Library Occupations							
25-4021	Librarians	140	$59,520	10	$57,740	250	$45,433
25-9031	Instructional Coordinators	180	$70,440	50	$65,170	60	$60,520
25-9041	Teacher Assistants	2,990	$28,500	50	$28,500	330	$22,110
Healthcare Practitioners and Technical Occupations							
29-1111	Registered Nurses	160	$51,460	--	$57,340	1,850	$63,683
29-1127	Speech-Language Pathologists	140	$64,490	130	$74,090	20	$77,690

		Elementary and Secondary Schools (NAIS 6111)			Private ownership All-Industries May 2010			State Government All-Industries May 2010		
SOC Code	**Occupation Title**	**Number in Survey**	**Mean Annual Earnings**		**Number in Survey**	**Mean Annual Earnings**		**Number in Survey**	**Mean Annual Earnings**	
	Food Preparation and Serving-Related Occupations									
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	100	$	34,420	200	$	45,020			
35-2012	Cooks, Institution and Cafeteria	450	$	27,840	1,920	$	29,270	280	$	28,388
35-2021	Food Preparation Workers	70	$	35,330	580	$	24,420	190	$	23,562
35-3021	Combined Food Preparation and Serving Workers	110	$	25,310	1,110	$	21,000	40	$	22,010
35-3022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	90	$	29,650	5,430	$	18,030	30	$	19,970
	Building and Grounds Cleaning and Maintenance Occupations									
37-1011	First-Line Supervisors/Managers of Housekeeping and Janitorial Workers	80	$	43,110	430	$	34,210	110	$	44,319
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	970	$	32,370	2,570	$	26,310	660	$	28,369
37-3011	Landscaping and Groundskeeping Workers	60	$	32,300	1,370	$	27,810	410	$	30,110
	Office SupportOccupations									
43-6014	Secretaries, Except Legal, Medical, and Executive	890	$	37,480	2,930	$	32,660	680	$	36,095
43-9061	Office Clerks, General	120	$	31,840	4,840	$	31,530	540	$	30,874
	Natural Resources, Construction, and Maintenance Occupations									
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	60	$	46,660	1,290	$	52,870	40	$	50,285
49-9071	Maintenance and Repair Workers, General	260	$	39,620	2,840	$	43,400	530	$	38,457
	Production, Transportation, and Material Moving Occupations									
53-3022	Bus Drivers, School or Special Client	1,010	$	32,520	230	$	26,990			
53-3021	Bus Drivers, Transit and Intercity				210	$	34,390	80	$	29,830

References

Allegreto, S., Corcoran, S, and Mishel, L. (2004). How does teacher pay compare? Methodological challenges and answers. Washington, D.C.: Economic Policy Institute.

Ballou, D. (1996). Do public schools hire the best applicants? *Quarterly Journal of Economics*, 111, pp. 97-134.

Bureau of Labor Statistics "Paid leave in private industry over the past 20 years," *Beyond the Numbers: Pay and Benefits Bulletin*, August 2013, Vol 2. No. 18. http://www.bls.gov/opub/btn/volume-2/paid-leave-in-private-industry-over-the-past-20-years.htm Accessed on Sept. 15, 2015

Clotfelter, Charles T., Helen F. Ladd and Jacob L. Vigdor. 2007. How and Why Do Teacher Credentials Matter for Student Achievement? CALDER working paper no. 2.

Clotfelter, Charles T., Helen F. Ladd and Jacob L. Vigdor. Teacher Student Matching and the Assessment of Teacher Effectiveness. *Journal of Human Resources*, 41(4), pp.778-820.

Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Education Policy Analysis Archives*, 8(1).

Ehrenberg, R. G., & Brewer, D. J. (1994). Do school and teacher characteristics matter? Evidence from High School and Beyond. *Economics of Education Review,* 13, pp. 1-17.

Ferguson, R. F., & Ladd, H. F. (1996). How and why money matters: An analysis of Alabama schools. In H. F. Ladd (Eds.), *Holding schools accountable: Performance-based reform in education* (pp. 265-298). Washington, DC: Brookings Institution.

National Center for Education Statistics (2014). Digest of Education Statistics. Washington, D.C.: U.S. Department of Education, Institution of Education Services, National Center for Education Statistics. Retrieved October 10, 2014 from http://nces.ed.gov/programs/digest/.

National Center for Education Statistics (2014). Projections and Trends of Education Statistics to 2022. Washington, D.C.: U.S. Department of Education, Institution of Education Services, National Center for Education Statistics. Release Date Feb. 27, 2014. Retrieved October 10, 2014 from http://nces.ed.gov/pubs2014/2014051.pdf.

National Education Association Research (2014). Rankings and Estimates: Rankings of the States 2013 and Estiamtes of School Statistics 2014. Release Date: March 2014. Retrieved October 13, 2014 from http://www.nea.org/assets/docs/NEA-Rankings-and-Estimates-2013-2014.pdf.

Podgursky, M and Tongrut, R. (2006). "(Mis)-Measuring the Relative Pay of Teachers." Education Finance and Policy. Vol. 1. No. 4 (Fall, 2006), pp. 425-440.

Research and Planning, Wyoming Department of Workforce Services. Analysis and personal communications from Tom Gallagher, Tony Glover, David Bullard, Patrick Harris, Michele Holmes, Lisa Knapp, Patrick Manning, and Michael Moore during September and October 2014.

Stoddard (2011). Monitoring cost pressures on teacher salaries in Wyoming. Final Report to the Joint Appropriations Interim Committee and the Joint Education Interim Committee.

Stoddard (2012-2014). Current status of cost pressures on teacher salaries in Wyoming. Final Report to the Joint Appropriations Committee and the Joint Education Committee.

Options for Updating Wyoming's Regional Cost Adjustment

Submitted to:

The Select Committee on School Finance Recalibration

Submitted by:

Lori L. Taylor, Ph.D.

October 2015

Options for Updating Wyoming's Regional Cost Adjustment Executive Summary

Like 11 other states, Wyoming adjusts its school funding formula to reflect regional differences in the cost of hiring a school district's most important (and most expensive) resource—teachers. The Wyoming Regional Cost Adjustment (RCA) which only applies to the salary components of the school funding model, is an amalgam of two alternative labor cost indices—the Wyoming Cost-of-Living Index (WCLI) and the Wyoming Hedonic Wage Index (HWI). Both labor cost indices are constructed so that the state average has an index value of 100. Locations where labor costs are 10% above the state average have an index value of 110 while locations where labor costs are 10% below the state average have an index value of 90. The WCLI is updated bi-annually, but the Wyoming HWI has not been updated since 2005.

Each district's RCA is the larger of the WCLI, the 2005 Wyoming HWI or 100. In other words, districts where labor costs are below the state average are treated as if their costs were equal to the state average. This Lake Woebegone approach, wherein no districts are below average, narrows the range of the geographic cost adjustment and greatly diminishes the ability of the RCA to equalize district purchasing power.

During both the 2005 and 2010 recalibrations of the funding model, state consultants recommended that the RCA be based solely on the HWI. This report contributes to the 2015 recalibration effort by:

1. **Refining the WCLI to better reflect regional differences in labor cost in Wyoming.** The current WCLI is based on budget weights that reflect the consumption patterns of the typical urban consumer in the rest of the country. Reweighting the WCLI using the weights generated by the U.S. Bureau of Labor Statistics (BLS) for Class D cities (those with populations below 50,000) would raise the WCLI for counties with relatively low housing costs, lower the WCLI for counties with relatively high housing costs, and make this indicator a more accurate measure of the cost of living in Wyoming.
2. **Updating and improving the 2005 Wyoming HWI.** The 2015 Wyoming HWI, which was estimated using data from the 2010-11 through 2014-15 school years, improves on the 2005 Wyoming HWI is a number of ways. The underlying hedonic wage analysis covers a much longer time frame (five years instead of two) and includes a much richer set of discretionary and nondiscretionary cost factors. For example, the 2015 Wyoming HWI replaces the problematic distance to Yellowstone National Park factor (which is used to calculate the 2005 Wyoming HWI) with an indicator for whether the nearest hospital is more than 25 miles away, a measure of geographic isolation that is more relevant to the everyday lives of teachers.
3. **Developing a comparable wage index (CWI) for Wyoming.** A CWI measures regional differences in the cost of hiring teachers by observing regional differences in the cost of hiring comparable non-teachers. Using data from the Wyoming Department of Workforce

Services and the BLS' Occupational Employment Survey (OES) I have estimated a CWI for each county in Wyoming. This OES CWI reflects labor cost estimates that control for the mix of occupations in a location, but cannot control for differences in the age or educational attainment of those workers.

4. **Exploring the implications of replacing the three-way RCA with one of these three alternatives.**

Analysis suggests that the any of the three options outlined above would improve the accuracy of the Wyoming RCA. However, basing the RCA solely on the OES CWI would, in many ways, be the most attractive strategy for updating Wyoming's RCA.

The OES CWI has a number of attractive features. It is clearly outside of school district influence, eliminating the risk that the regional cost index would misidentify high spending districts as high cost ones. It reflects not only regional differences in cost of living, but also differences in local amenities. The CWI methodology is also the most common approach to regional cost adjustment in other states.

If the OES CWI were rebased so that 100 equaled the state minimum, then most Wyoming school districts would benefit from the change to the OES CWI. Only a handful of districts—most notably Teton County #1—would experience a decline in their RCA. Furthermore, by properly calibrating the salary used in the funding model calculations, this change in the RCA could be accomplished with only a limited budgetary impact.

Whichever option the Legislature chooses, a mechanism for regular updates to the RCA should be put in place. The Wyoming economy is dynamic and labor market conditions in Wyoming are constantly changing. For the RCA to work as intended, it must accurately reflect current differences in labor cost, and not be allowed to drift out of date.

Introduction

The price school districts must pay for their most important resource—teachers—varies from place to place. As a result, some school districts must pay higher wages to attract the same high quality teachers available to other districts at lower cost. Cost adjustments to a school funding formula equalize the purchasing power of school districts so they can recruit and retain equivalent school personnel.

The challenge in constructing a regional cost adjustment (RCA) is ensuring that the adjustment accurately reflects costs, and only reflects costs. A RCA that misidentifies high spending districts as high cost districts would exacerbate existing inequities instead of reducing them.

Wyoming is one of the dozen states that use a RCA in their school finance formulas. The Wyoming RCA is designed to provide additional resources to school districts with higher labor costs. As such, it only applies to the salary components of the school funding model.

The Wyoming RCA is an amalgam of two alternative labor cost indices—the Wyoming Cost-of-Living Index (WCLI) and the Wyoming Hedonic Wage Index (HWI).[1] Both indices are constructed so that the state average has an index value of 100. Locations where labor costs are 10% above the state average have an index value of 110 while locations where labor costs are 10% below the state average have an index value of 90.

Each district's RCA is the larger of the WCLI, the Wyoming HWI or 100. In other words, districts where labor costs are below the state average are treated as if their costs were equal to the state average. This Lake Woebegone approach, wherein no districts are below average, narrows the range of the geographic cost adjustment and greatly diminishes the ability of the RCA to equalize district purchasing power.

During both the 2005 and 2010 recalibrations of the funding model, state consultants recommended that the RCA be based solely on the HWI. This report contributes to the 2015 recalibration effort by:

1. Refining the WCLI to better reflect regional differences in labor cost in Wyoming,
2. Updating and improving the 2005 Wyoming HWI,
3. Developing a comparable wage index (CWI) for Wyoming , and
4. Exploring the implications of replacing the three-way RCA with one of these three alternatives.

Analysis suggests that the any of the three options outlined above would improve the accuracy of the Wyoming RCA. However, basing the RCA solely on a county-level CWI would in many ways be the most attractive strategy for updating Wyoming's RCA.

[1] For more on the Wyoming Cost of Living Index, visit http://eadiv.state.wy.us/WCLI/Cost.html

Regional Cost Adjustments in Theory and Practice

As Table 1 illustrates, three basic strategies have been used to develop regional cost adjustments to school funding formulas: cost of living indices, hedonic wage indices (also known as teacher cost indices), and comparable wage indices.[2]

Table 1: Regional Cost Adjustment Strategies, by State in 2014-2015

State	Name of Index	Index Type
Alaska	District Cost Factor	Hedonic Wage Index
Colorado	Cost of Living Factor	Cost of Living Index
Florida	District Cost Differential	Comparable Wage Index
Maine	Regional Labor Market Area Adjustment	Hedonic Wage Index
Maryland	Geographic Cost of Education Index	Hedonic Wage Index
Massachusetts	Wage Adjustment Factor	Comparable Wage Index
Missouri	Dollar Value Modifier	Comparable Wage Index
New Jersey	Geographic Cost Adjustment	Comparable Wage Index
New York	Regional Cost Index	Comparable Wage Index
Texas	Cost of Education Index	Hedonic Wage Index
Virginia	Cost of Competing Adjustment	Comparable Wage Index
Wyoming	Regional Cost Adjustment	Cost of Living Index & Hedonic Wage Index

Source: Taylor (forthcoming).

Colorado is the only state other than Wyoming that uses a cost of living index (CLI) in its school finance formula. In both states, CLIs are constructed by tabulating the cost of a specified collection of goods and services used by consumers in each community in a method called the "market-basket" approach. Differences among communities in the cost of a basket of consumer goods and services capture differences in the cost of living.

Five states—including Wyoming—incorporate a HWI into their school funding formula. A HWI uses data on teacher compensation and statistical technique to estimate how much more or less it costs each school district to recruit and employ equivalent school personnel. Researchers use regression analysis to divide the observed variation in teacher salaries into that which is attributable to factors within the discretion of local school districts (such as teacher demographics, teaching assignments, and the length of the school year) and that which is attributable to factors outside of school district control (such as the local cost of living, the

[2] For more on regional cost adjustments, see Taylor (forthcoming).

degree of geographic isolation and student demographics).[3] Only factors outside of school district control represent cost differences that should be accounted for in funding formulas, so researchers construct a HWI by predicting the full-time-equivalent salary in each school district, assuming that all districts had the same values for the discretionary cost factors.

Six states use a comparable wage index (CWI) to make regional cost adjustments. A CWI measures regional variations in the price that school districts must pay to attract high quality teachers by observing regional variations in the salaries of comparable professionals who are not teachers.[4] It is based on the premise that all types of workers—not just teachers—demand a higher salary where the price of a home is high, the climate is inhospitable, or the closest hospital is many miles away.

Advantages and Disadvantages of the Three Approaches

Each method has its advantages and disadvantages. Either a CLI or a CWI will provide cost adjustments that are clearly outside of school district influence, but they are both market-level measures. They cannot detect cost differences at the school or district levels.

In contrast, HWIs are able to pick up systematic differences in cost from one district to another within the same labor market, but must rely on statistical technique and researcher judgment to control for the influence of school district choices and thereby avoid mislabeling high spending districts as high cost districts. Statistical models and researcher judgment are inherently subject to criticism. HWIs have also been criticized as subject to school district manipulation (McMahon 1994), vulnerable to omitted variables bias (Goldhaber 1999) and distorted by the noncompetitive nature of the teacher labor markets (Hanushek 1999).

A CLI tends to overstate the cost of hiring in locations with a lot of amenities that make it a desirable place to live and work (Rothstein and Smith 1997, Stoddard 2005). CLIs can also be biased if the market basket used to construct them does not reflect teacher spending patterns, or teachers do not live and work in the same labor market area.

A CWI reflects not only differences in the cost of purchased goods and services (like housing) but also differences in amenities (like the climate or access to health care). As such, a CWI offers a more comprehensive measure of local conditions than does a CLI. However, comparability is always a concern. If the non-educator population differs substantially from the educator population in terms of age, educational background, or tastes for local amenities, then the CWI may overstate (or understate) the wage differentials that teachers will require.

[3] For more on the use of hedonic wage models in education, see Chambers (1995, 1997, 1998), Goldhaber (1999), or Taylor (2010, 2008a and 2008b).

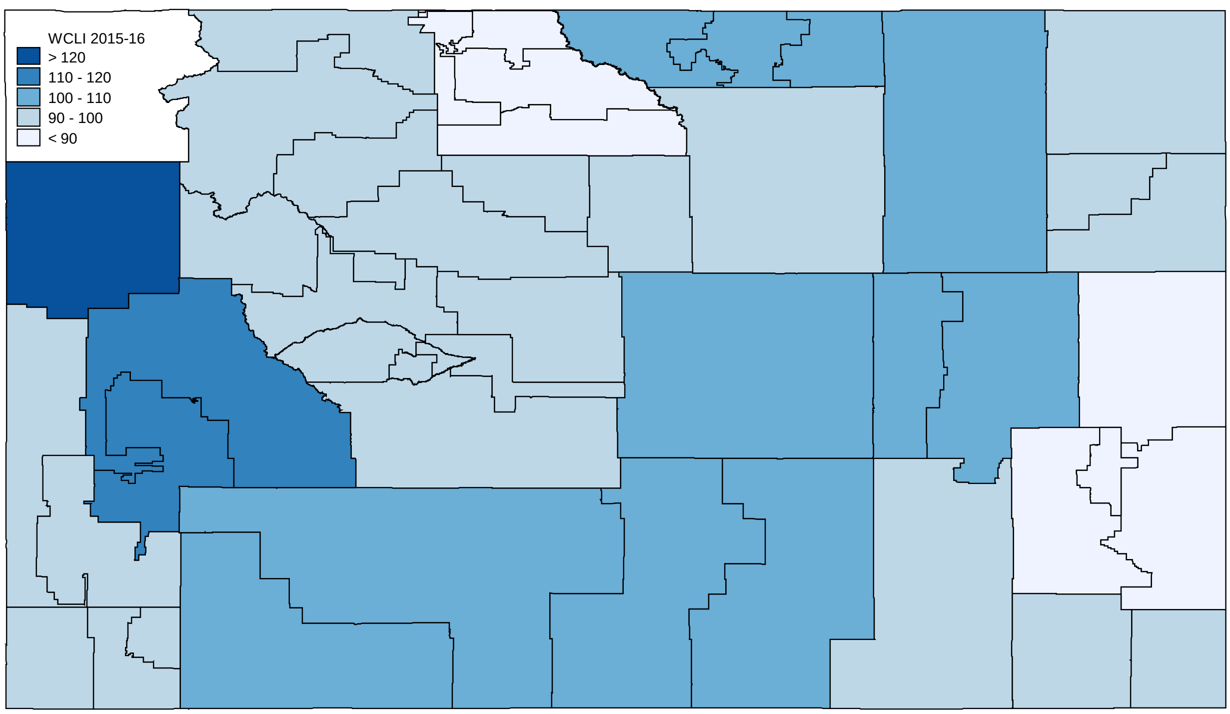
[4] For more on comparable wage indices, see Taylor (2014), Taylor and Fowler (2006), Rothstein and Smith (1997), Goldhaber (1999), or Guthrie and Rothstein (1999).

Refining the WCLI

The WCLI is modeled after the U.S. Bureau of Labor Statistics' (BLS's) Consumer Price Index for urban consumers (CPI-U). It is produced bi-annually by the Wyoming Department of Administration & Information's Economic Analysis Division. Twice a year, the Economic Analysis Division collects data on prices for food, housing, apparel, transportation, medical services, and recreation and personal care. The WCLI is a weighted average of the prices for each of these components, where the weights reflect the share of the typical consumer's budget devoted to each component. Because they are designed to measure consumption costs, the CPI-U and WCLI exclude any consumer expenditures that the BLS does not consider to be consumption. Thus, these indices are constructed using a zero weight for taxes not directly associated with the purchase of consumer goods and services (such as income and Social Security taxes) and investment items (such as stocks, bonds, real estate, and life insurance).

The WCLI used in the RCA is the average of the six consecutive semi-annual index reports completed by January 1 of the immediately preceding school year. Figure 1 illustrates the geographic distribution of the WCLI used in the RCA for the 2015-16 school year. Darker colors indicate higher index values.

Figure 1: The Wyoming Cost-of-Living Index Used in the RCA, 2015-16



Source: Wyoming Department of Administration & Information's Economic Analysis Division.

Clearly, the WCLI indicates that there is substantial variation in the cost of living from one part of Wyoming to the next. The WCLI for Teton County School District #1, the school district with the highest index value in 2015-16, was 132 while the WCLI for Platte County School Districts

#1 and #2, the school districts with the lowest index values in 2015-16, was 87. Thus, the WCLI indicates that costs differ by as much as 52 percent (132/87=1.52) from one part of Wyoming to the next.

The wide range of index values across the state and the particularly high index values in Teton County are almost exclusively attributable to the housing component of the WCLI. Regional differences in housing cost explain 96 percent of the regional variation in the WCLI.

The WCLI is based on the same market basket as the CPI-U.[5] In other words, the WCLI is constructed assuming that the purchasing patterns of Wyoming consumers mirror those of city-dwellers in the rest of the United States. They don't. As a general rule, the residents of Wyoming spend a smaller share of their budgets on housing than the residents of any other state except Iowa and North Dakota.[6]

The BLS recognizes that the typical budget shares for consumers in large cities like San Francisco, New York City and Boston are not the same as the typical budget shares for consumers in smaller cities. Therefore, the BLS publishes not only budget shares for the average U.S. city (i.e. the CPI-U weights used in the construction of the WCLI) but also budget shares that differ according to city size.[7] As Table 2 illustrates, the BLS estimates that consumers in cities with a population less than 50,000—which the BLS labels Class D locations—typically spend a much smaller share of their budgets on housing than the average urban consumer.

Based on the Census Bureau's 2014 population estimates, Casper and Cheyenne are the only Wyoming cities that are larger than the Class D threshold, and neither city has a population greater than 65,000. Therefore, the Class D budget weights are a much better fit for Wyoming than the U.S. City Average budget weights.

[5] Wyoming Department of Administration and Information, Division of Economic Analysis (1999).

[6] The share of households spending more than 30 percent of their incomes on housing was calculated by taking a weighted average of the share of owner-occupants spending 30 percent or more of their incomes on housing and the share of renters spending 30 percent or more of their incomes on housing. The weights were the shares of housing units in each type. The data come from the 2011 Statistical Abstract of the United States. For the data tables, visit http://www.census.gov/compendia/statab/cats/construction_housing/homeownership_and_housing_costs.html

[7] Tables downloaded September 24, 2015 from http://www.bls.gov/cpi/cpiriar.htm.

Table 2: CPI-U Weights by City Size, December 2013

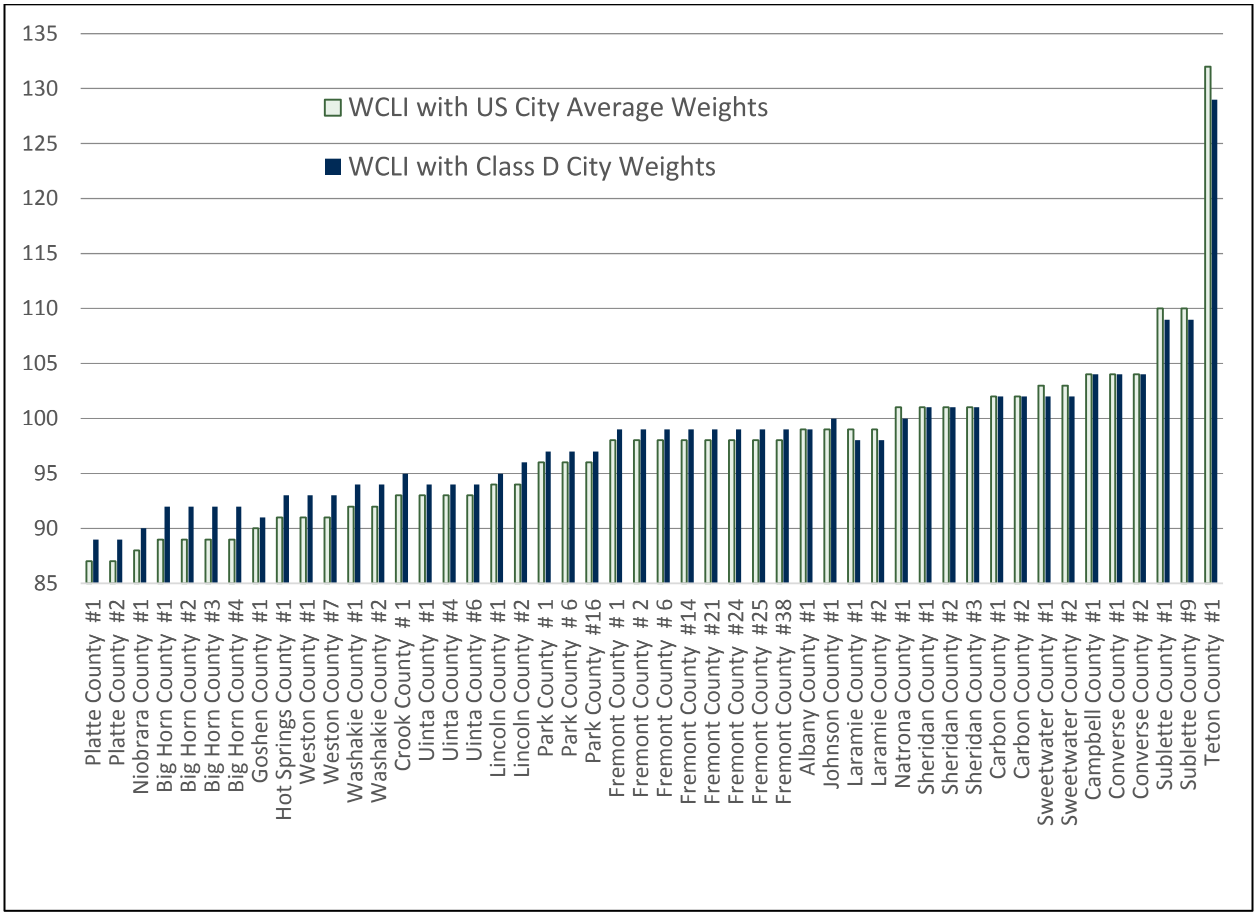
	U.S. City Average	Class D (Population < 50,000)
Food and Beverages	14.9%	15.9%
Housing	41.4%	38.1%
Shelter	32.0%	27.5%
Rent of primary residence	7.0%	5.7%
Lodging away from home	0.8%	0.8%
Owners' equivalent rent of primary residence	23.9%	20.5%
Tenants' & household insurance	0.4%	0.4%
Fuel and utilities	5.2%	6.2%
Fuel oil and other fuels	0.3%	0.4%
Electricity	2.9%	3.8%
Utility (piped) gas service	0.8%	0.7%
Water & sewer & trash collection services	1.2%	1.3%
Household furnishings and operations	4.3%	4.4%
Apparel	3.4%	3.4%
Transportation	16.4%	17.6%
Medical care	7.6%	8.7%
Recreation	5.8%	6.0%
Education and communication	7.1%	6.8%
Other goods & services	3.4%	3.5%
Total	100%	100%

Source: US Bureau of Labor Statistic. *http://www.bls.gov/cpi/cpiriar.htm* .

As Figure 2 illustrates, using the U.S. City Average budget weights rather than the Class D budget weights yields an index that understates the cost of living for 31 of the 48 Wyoming school districts and overstates the cost of living for 8 of the 48. (The remaining 9 are unaffected.) If the last six WCLI reports had been constructed using the more appropriate, Class D budget weights, the WCLI used in the construction of the 2015-16 RCA would have been 3 percentage points lower for Teton County.[8]

[8] The six-report average WCLI would have been 3 percentage points higher for Big Horn County, but since the value of the WCLI would have remained below 100, the RCA would have been unaffected.

Figure 2: The Effect of Alternative Budget Weights on the WCLI



Source: Wyoming Department of Administration & Information's Economic Analysis Division, U.S. Bureau of Labor Statistics and author's calculations.

Notably, the Class D budget weights still place a much greater weight on shelter than the budget weights used to construct the Colorado Cost of Living Factor. The Colorado weights are based on an analysis of consumer expenditures (which is not the same thing as consumption) and include a number of items excluded from the WCLI. As a result, shelter costs—which are primarily rents and owner's equivalent rents—have a budget weight of 32% in the WCLI and 28% in the Class D budget, but only 18% in the construction of the Colorado Cost of Living Factor (Table 3).[9] If the Colorado budget weights were used to construct a cost of living index for Wyoming, the index values for regions with high housing costs (such as Teton County) would be even lower than they are with the Class D budget weights.

[9] Shelter costs include rent of primary residence, lodging away from home, owners' equivalent rents (which include property taxes and maintenance expenses) and homeowners and renters insurance.

Table 3: Budget Weights in the WCLI and Colorado Cost of Living Factor

Item	Wyoming	Colorado
Food and beverages	14%	14%
Shelter	32%	18%
Other housing related	16%	15%
Apparel	5%	3%
Transportation	16%	19%
Medical	8%	7%
Recreation and other personal goods and services	9%	12%
Personal insurance, pensions and cash contributions	0%	10%
Total	100%	100%

Source: Wyoming Department of Administration & Information's Economic Analysis Division and Corona Insights (2014).

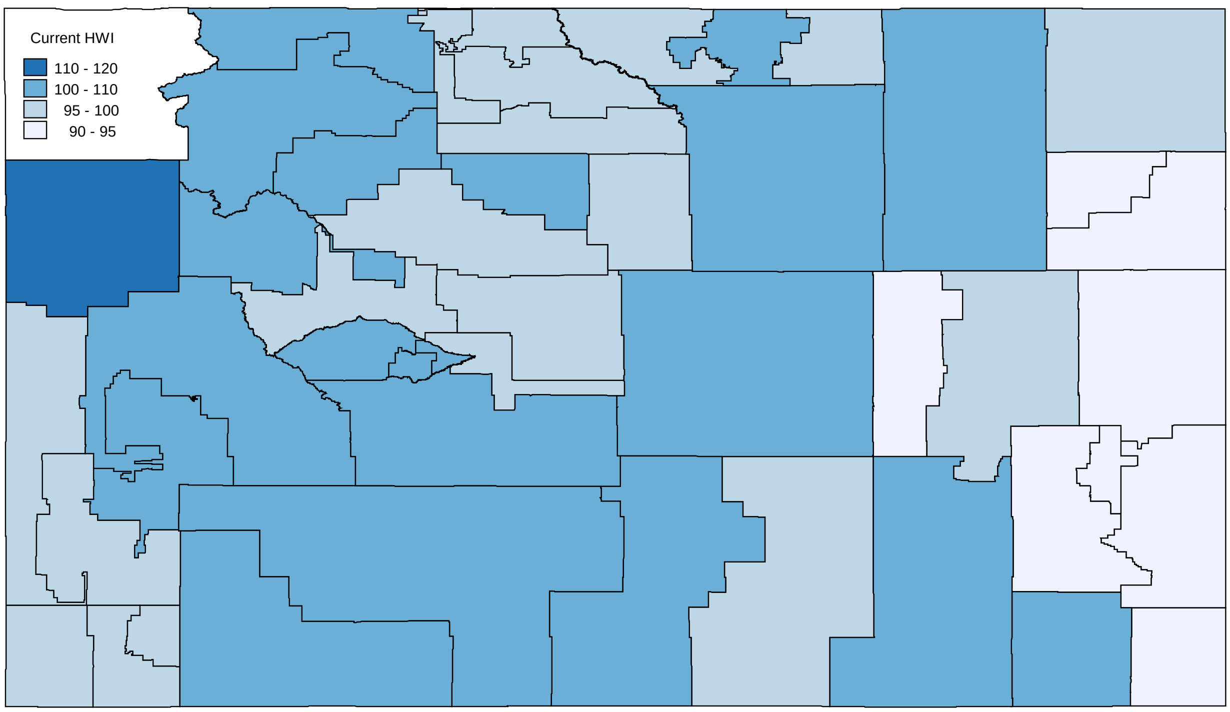
Note: The other housing related category includes telephone and daycare in both states.

Updating and Improving the Wyoming Hedonic Wage Index

The 2005 Wyoming HWI is based on a hedonic wage model of base salaries estimated by Bruce Baker using data from the 2003-04 and 2004-05 school years. The uncontrollable cost factors that drive differences in the 2005 Wyoming HWI are: the WCLI, four measures of geographic isolation,[10] three measures of student demographics,[11] and the district average supplemental salary. The supplemental salary variable was included on the grounds that "some districts have the advantage of being able to provide more supplemental earnings opportunities not solely as a function of budgetary discretion but as a function of uncontrollable conditions," (Baker 2005, p. 230). The index values used in the RCA for 2015-16 are based on the values of the uncontrollable cost factors in 2004-05.

Figure 3 illustrates the geographic distribution of the 2005 Wyoming HWI. Darker colors indicate higher index values.

Figure 3: The 2005 Wyoming Hedonic Wage Index Used in the RCA, 2015-16



Source: Baker (2005).

[10] The four measures of geographic isolation are the population density, the distance to Yellowstone National Park, the distance to a city with a population of at least 15 thousand, and the distance to a city with a population of at least 50 thousand.

[11] The student demographic variables are the school-level unduplicated "at risk" counts, the percent of special education students, and the percent of mobile students. For construction of the index, all three variables were averaged across 2003-04 and 2004-05.

As the figure illustrates, according to the 2005 Wyoming HWI there is substantial variation in the teacher salary cost from one part of Wyoming to the next. The lowest index values are found in the rural and eastern parts of the state, while the highest index values are in Teton County. The 2005 Wyoming HWI for Teton County School District #1, the school district with the highest index value, is 118, while the 2005 Wyoming HWI for Platte County School District #2, the school district with the lowest index value, is 93. Thus, the 2005 Wyoming HWI indicates that labor costs differ by as much as 27 percent (118/93) from one part of Wyoming to the next.

The inclusion of the district's average supplemental salary in the construction of the 2005 Wyoming HWI makes the index particularly vulnerable to criticism. As Baker acknowledges, the extent to which a school district provides supplemental earnings opportunities is at least partially discretionary. Basing a HWI on a variable that is subject to school district discretion undermines the argument that the index reflects only cost variations that are outside of school district control. The 2005 Wyoming HWI has also been criticized for including the distance to Yellowstone National Park as one of the measures of geographic isolation.

In addition to the technical criticisms of the 2005 Wyoming HWI, there is a more fundamental concern: the 2005 Wyoming HWI is badly out of date. While geography does not change over time, student demographics and the WCLI clearly do. It is hard to defend the position that the HWI should remain unchanged when the WCLI—one of the uncontrollable cost factors used to construct the HWI—is updated annually.

To help inform the 2015 recalibration effort, this analysis presents a 2015 Wyoming HWI. The 2015 Wyoming HWI improves on the 2005 Wyoming HWI in four important ways:

1. The analysis underpinning the 2015 Wyoming HWI uses more recent data and a much longer time series. The 2005 Wyoming HWI was estimated using two years of data covering the 2003-04 and 2004-05 school years. This analysis covers the five school years from 2010-11 through 2014-15.[12] All 9,678 individuals with complete data who taught full time in a Wyoming public school for at least one year during that period are included in the analysis.[13] Using a longer time series allows for a richer specification of controllable and uncontrollable cost factors and should lead to more precisely measured regional cost adjustments.
2. Where the analysis underlying the 2005 Wyoming HWI treated the district average level of supplemental pay as an uncontrollable cost factor that could influence the base salary a teacher was willing to accept from a district, this analysis takes a different tack. Teachers are likely to consider their total salary not just their base salary when deciding whether or not to

[12] Data on earnings, teacher characteristics and job assignments were drawn from the Wyoming Department of Education (WDE) 602 fall data collection files for each school year.
[13] Due to data quality concerns, teacher records with full-time-equivalent (FTE) total salaries greater than $120,000 or less than 80 percent of the first step on the district's salary schedule were excluded from the analysis, as were individuals with a reported FTE less than 0.9 or greater than 1.1, or an FTE in teaching greater than 110 percent of the individual's total FTE. Individuals with contracts for fewer than 150 days or more than 200 days were also excluded.

accept a new position or stay in their existing one, and school districts have great discretion over the size of the supplements they offer for coaching, tutoring after school or advising the debate team. Therefore, this analysis treats most forms of supplemental salary as just another part of an individual's compensation package, and estimates a hedonic model of total salary, not just base salary.[14]

3. The 2015 hedonic wage model uses a much richer set of discretionary factors (see Table 4). In addition to the number of contract days and the teacher demographic characteristics included in Baker's 2005 analysis (indicators for gender, race, advanced degrees, total teaching experience, and secondary school assignment) this analysis also includes indicators for the subject matter of the teaching assignment; for whether or not the teacher received her bachelor's degree from the University of Wyoming; for whether or not the teacher was an education major as an undergraduate; for whether or not the teacher was assigned to a school with more than 1,000 students; for whether or not the teacher was assigned to a middle school, elementary school, or K-12 school; and for whether or not the teacher was assigned to a number of non-teaching activities such as coaching or advising. (Because all of the teachers under analysis were, by definition, assigned to the teaching activity full time, there is no need for an indicator for teaching.) The model includes district-specific teaching experience and an indicator for first-year teachers to add further richness to the specification of teacher characteristics. Broadening the set of teacher and job characteristics included in the model strengthens the argument that the resulting regional cost index reflects only factors that are outside of school district control.

Table 4: Discretionary Factors from the 2015 Hedonic Wage Model

Years of experience in the school district	Teaching assignment indicators
Years of experience, total	English
Highest degree held	Social science
University of Wyoming BA indicator	Math
Undergraduate education major indicator	Health and P.E.
Non-teaching assignment indicators	Foreign language
Advisor/sponsor	Vocational education
Assistant coach	Bilingual/ESL
Coach	Fine arts
Classified staff position	Science
Head teacher	Special education
Principal	Large school (enrollment > 1,000)
Support staff position	School type (elementary, middle, etc.)
Tutor	Length of typical teacher contract
Other administrator	

[14] The lone exception is stipends for coaching. Coaching stipends in Wyoming vary a lot from district to district. For example, the supplemental salary received by football coaches during the 2010-11 school year ranged from $3,243 to $9,200. Because there is little reason to believe that this variation in coaching stipends reflects regional differences in labor cost (and there is no way of controlling for differences in coaching quality that might successfully explain the differences in salary) all supplemental pay for coaches has been excluded from the measure of total salary.

4. The 2015 hedonic wage model relies on an improved set of uncontrollable cost factors (Table 5). As with the construction of the 2005 Wyoming HWI, the uncontrollable cost factors include the WCLI, multiple measures of geographic isolation and multiple measures of student need. However, the 2015 hedonic wage model replaces the distance to Yellowstone National Park with an indicator for whether or not the nearest hospital is more than 25 miles away, a measure of geographic isolation that is more relevant to the everyday lives of teachers.[15] Due to data availability, population density is measured at the county level. In addition, the 2015 analysis replaces the unduplicated-at-risk percent and the percent mobile students with two alternative measures of student need—the percent of students who are English language learners and the percentage of students who qualify to receive free school lunches. Taylor (2011) found that these two variables better explain salaries than do the student demographic indicators used in Baker's 2005 analysis. In addition, the set of uncontrollable cost factors also includes a newly developed CWI for Wyoming counties. Including the CWI strengthens the model by providing a direct measure of the labor market alternatives available to Wyoming school teachers.

Table 5: Uncontrollable Cost Factors from the 2015 Hedonic Wage Model, with Comparison to the Factors Used in Construction of the 2005 Wyoming HWI

Uncontrollable Cost Factors	Used in the 2015 HWI?	Used in the 2005 HWI?	Impact of the Cost Factor on the 2005 HWI
WCLI	Yes	Yes	Positive
OES CWI	Yes	No	
Geographic isolation			
Nearest hospital > 25 miles	Yes	No	
Miles to nearest city of 50,000[16]	Yes	Yes	Positive
Miles to nearest city of 15,000	Yes	Yes	Negative
Miles to Yellowstone National Park	No	Yes	Negative
Population density (county)	Yes	No	
Population density (10-mile radius)	No	Yes	Positive
Student demographics			
Percent Free Lunch	Yes	No	
Percent Special Ed.	Yes	Yes	Positive
Percent English language learners	Yes	No	
Percent unduplicated at risk	No	Yes	Negative
Percent mobile	No	Yes	Negative
District average supplemental salary	No	Yes	Negative

[15] Distance to the nearest hospital was determined as the crow flies using data from the National Center for Education Statistics on the latitude and longitude of each Wyoming campus, and data from the Wyoming Hospital Association on the street address of each Wyoming Hospital.

[16] For the 2015 HWI analysis, the distance to the nearest city with a population of 50,000 and the nearest city with a population of 15,000 were calculated as-the-crow-flies using the U.S. Census Bureau's 2009 population estimates and latitude and longitude files for places. For both measures, the nearest city need not be within the state of Wyoming. Indeed, half of the school districts in Wyoming are closer to a city of 50,000 in another state than they are to a city of that size within Wyoming.

Table 6 presents selected results from two alternative estimates of the hedonic wage model for total teacher salaries in Wyoming. (The full set of regression coefficient and standard errors is presented in Appendix A.) Both models were estimated using statistical techniques that explicitly incorporate the fact that most teachers are observed more than once.[17] The dependent variable in each case is the natural log of full-time-equivalent total teacher salaries.

Table 6: Alternative Specifications of the Hedonic Wage Model

	Teacher Fixed Effect Model	AR Random Effects Model
WCLI	0.0012	0.0023
	(0.0002)**	(0.0001)**
OES CWI	0.0051	0.0041
	(0.0005)**	(0.0001)**
County pop. density (log)	0.0597	0.0659
	(0.0054)**	(0.0012)**
Distance to a 50,000 city	0.0003	0.0004
	(0.0001)**	(0.0000)**
Distance to a 15,000 city	0.0007	0.0008
	(0.0002)**	(0.0000)**
Nearest hospital > 25 miles	-0.0412	-0.0455
	(0.0097)**	(0.0023)**
Percent free lunch	0.0018	0.0020
	(0.0005)**	(0.0004)**
Percent free lunch * WCLI	-0.00002	-0.00002
	(0.0000)**	(0.0000)**
Percent English language learners	0.0003	0.0002
	(0.0001)**	(0.0001)*
Percent special education	-0.0001	-0.0001
	(0.0001)	(0.0001)
Includes year indicators?	Yes	Yes
Includes discretionary factors?	Yes	Yes
Includes teacher fixed effects	Yes	No
Includes teacher random effects?	No	Yes
Number of observations	35,018	35,018
Number of individual teachers	9,678	9,678

*Note: The dependent variable for both models is the log of total annual salary. Robust standard errors are in parentheses. The robust standard errors for the Teacher Fixed Effects model have been clustered by teacher; clustering is not appropriate for the AR Random Effects specification. The asterisks indicate a coefficient that is * significant at 5%; ** significant at 1%.*

[17] In contrast, Baker (2005) used a between-teachers model to estimate the 2005 Wyoming HWI. The between-teachers model uses only information about differences between teachers, and largely ignores information about the changing experiences and earnings of individual teachers over time. A between-effects model can be desirable when there is little variation across time, as is the case when the analysis is based on only two years of data. In such situations, the cross-time variation is as likely to be noise as information. The between-effects estimation strategy is not desirable for analyses—like this one—that incorporate many years of data because it fails to exploit much of the available information about salaries.

The first model is a teacher fixed effects model. The fixed effects methodology adjusts for any variation in salaries that might arise from persistent, but unmeasured teacher characteristics such as intelligence or verbal ability. As such, it does the best possible job of controlling for differences in salary that can be attributed to discretionary factors. Unfortunately, in doing so, it also removes much of the variation in cost that is driven by stable characteristics of school districts. Stable district characteristics—such as geographic remoteness or a persistently high cost of living—will only register for teachers who change districts. If teachers who change districts are not representative of the teaching population as a whole, the fixed-effects model can be misleading. During the period under analysis, less than 7 percent of the teachers in Wyoming changed school districts. Movers were disproportionately inexperienced teachers who did not have an advanced degree, suggesting that mobile teachers may be systematically different from teacher who do not move between school districts.

The second model is an autoregressive (AR) random effects model. Like the fixed effects model, the AR random effects model incorporates all of the information in the data and (partially) adjusts for persistent but unmeasured differences in teacher quality. Unlike the fixed effects model, the AR random effects model captures the influence of cost factors that are relatively stable over time using data from all teachers, not just the teachers who move between districts. Here, the random effects model has been estimated allowing the residuals to follow the autoregressive pattern found in the data.[18] (An autoregressive pattern to teacher salaries means that if a teacher earns more than the model predicts in one year, he or she will probably earn more than the model predicts the next year too.)

Both models do a good job of capturing variations in teacher salaries. As expected, salaries increase with teaching experience and educational attainment. Salaries are systematically higher in school districts where the school year is longer. Teachers who take on nonteaching duties earn more than other teachers, but there is no evidence of a salary premium for science and math teachers. Teachers who majored in something other than education earned systematically more than other teachers, all other things being equal. On the other hand, teachers with a bachelor's degree from the University of Wyoming earned systematically less than teachers with a bachelor's degree from another institution (at least according to the AR random effects model.)

On purely statistical grounds, the fixed effects model fits the data better than the AR random effects model. Statistical tests easily reject the AR random effects model in favor of the fixed effects model.[19] Furthermore, relying on the fixed effects model to construct the 2015 HWI would largely address concerns about the potential for bias arising from an incomplete specification of teacher characteristics. On the other hand, the fixed effects modeling strategy

---

[18] A Wald test for the absence of autocorrelation was rejected at the 1 percent level. See Drukker (2003) and Wooldridge (2002).

[19] A Hausman test of model specification reject the random effects model in favor of the fixed effects model at the 1 percent level.

may also strip from the index much of the information about important, quasi-fixed district characteristics like a relatively low cost of living.

Because the fixed effect model may be failing to pick up important cost factors and the relatively small number of teachers who move between districts appear to be systematically different from other teachers, the AR random effects model is the best option for updating the Wyoming HWI. The AR random effects model incorporates all of the available information about the distribution of teacher salaries and some of the information about unmeasured teacher characteristics without losing the ability to capture the impact of the stable cost factors. Furthermore, the list of discretionary characteristics is quite extensive. The additional detail incorporated into this update greatly reduces the risk that there are important teacher characteristics that have been omitted from the model.

The 2015 Wyoming HWI

The 2015 Wyoming HWI was constructed by using the AR random effects model to predict the salary a teacher with state average characteristics would earn in each Wyoming school district. This approach treats the specified cost factors as uncontrollable; all other factors that influence salaries—including any relevant omitted factors—are treated as discretionary. A district's index value is the district's predicted salary in 2014-15 divided by the average predicted salary in the state and then multiplied by 100. Table 7 provides descriptive statistics for the 2015 Wyoming HWI and the 2005 Wyoming HWI. Appendix C presents the 2015 Wyoming HWI and 2005 Wyoming HWI for each Wyoming school district.

Table 7: Comparing the 2005 Wyoming HWI with the 2015 Wyoming HWI

	Mean	Std. Deviation	Minimum	Maximum	Maximum Excluding Teton County
2015 Wyoming HWI	100.0	4.7	90	113	110
2005 Wyoming HWI	100.3	4.6	93	118	107

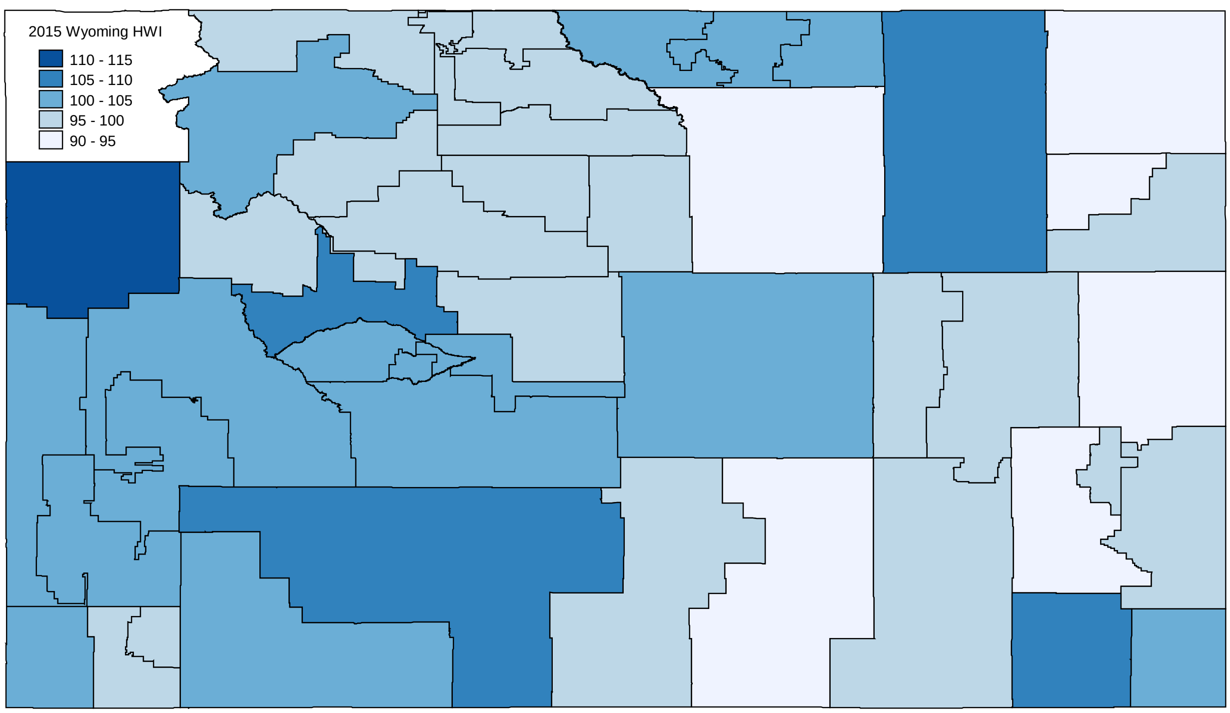
As the table illustrates, the 2015 Wyoming HWI indicates that there are substantial regional cost differences in Wyoming. By this measure, labor cost is 26 percent higher in the highest cost district (Teton County School District #1) than it is in the lowest-cost districts (Niobrara County School District #1 and Carbon County School District #2).

The 2015 Wyoming HWI has a slightly smaller range than the 2005 Wyoming HWI, which indicates that labor cost is 27 percent higher in the highest cost district than in the lowest cost district. However, the 2015 Wyoming HWI has a larger range than the 2005 Wyoming HWI if Teton County, with its particularly high WCLI, is excluded from the comparison.

Figure 4 illustrates the 2015 Wyoming HWI. Again, darker colors indicate higher index values. As the figure indicates, index values are generally lowest along the state's eastern border. They are highest in Teton County.

The 2015 Wyoming HWI is highest in Teton County because the WCLI is unusually high in that county. Researchers frequently worry that an outlier of the magnitude of Teton County might bias the estimation of the hedonic wage model and therefore have undue influence on the resulting HWI (Baker 2005). However, that is not the case with the 2015 Wyoming HWI. As a sensitivity check, I re-estimated the AR-random effects model excluding the teachers in Teton County school district and constructed an alternative HWI. (For model specification, see Appendix A.) The index values were largely unaffected, suggesting that Teton County does not have undue influence on the model. Excluding Teton County teachers from the estimation lowers the HWI for Teton County #1 from 113 to 110, but has very little effect on the index values for the rest of the districts in Wyoming. The correlation between the HWI estimated with Teton County and the HWI estimated without Teton County was 0.993 for the districts other than Teton County #1. Given the similarity between the two indices, either the 2015 Wyoming HWI or the alternative HWI would be a viable regional cost index for Wyoming.

Figure 4: The 2015 Wyoming Hedonic Wage Index



Source: Author's calculations.

Developing a Comparable Wage Index for Wyoming

The comparable wage approach to geographic cost adjustment recognizes that teachers are not the only workers who are sensitive to the cost of living and the general attractiveness of the community. All types of workers demand a higher salary in locations with a high cost of living and a lack of offsetting amenities. Therefore, regional variations in the price that school districts must pay to attract high quality teachers will be reflected in the cost of hiring comparable individuals who are not teachers. Conceptually, if nurses in Laramie earn 10 percent more than the national average for nurses, accountants in Laramie earn 10 percent more than the national average for accountants, computer programmers in Laramie earn 10 percent more than the national average for programmers, and so on, then a reasonable estimate is that teachers in Laramie will also expect to earn 10 percent more than the national average for teachers.

The National Center for Education Statistics' (NCES) Comparable Wage Index (CWI) was designed specifically to capture regional wage differences for college graduates who are not educators.[20] The baseline estimates come from a regression analysis of the individual earnings data from the 2000 U.S. Census. Subsequent updates to that baseline came from regression analyses of earnings data from the BLS' Occupational Employment Survey (OES).

The two components of the NCES CWI suggest two complementary strategies for estimating a CWI for Wyoming. First, one could estimate a CWI using data from the American Community Survey (ACS). Second, one could estimate a CWI using the earnings data in the OES.

The ACS, which is conducted annually by the U.S. Census Bureau, has replaced the decennial census as the primary source of demographic information about the U.S. population. The advantage to using the ACS to estimate a CWI is that the ACS provides information not only on the annual earnings of workers, but also on their other demographic characteristics, including their hours worked, ages and levels of educational attainment. The rich demographic detail in the ACS make it possible to control for regional demographic differences in the construction of a CWI, ensuring that the index does not indicate that labor cost are low in a location simply because the typical worker in that location is younger or less well educated than the typical worker in other locations.

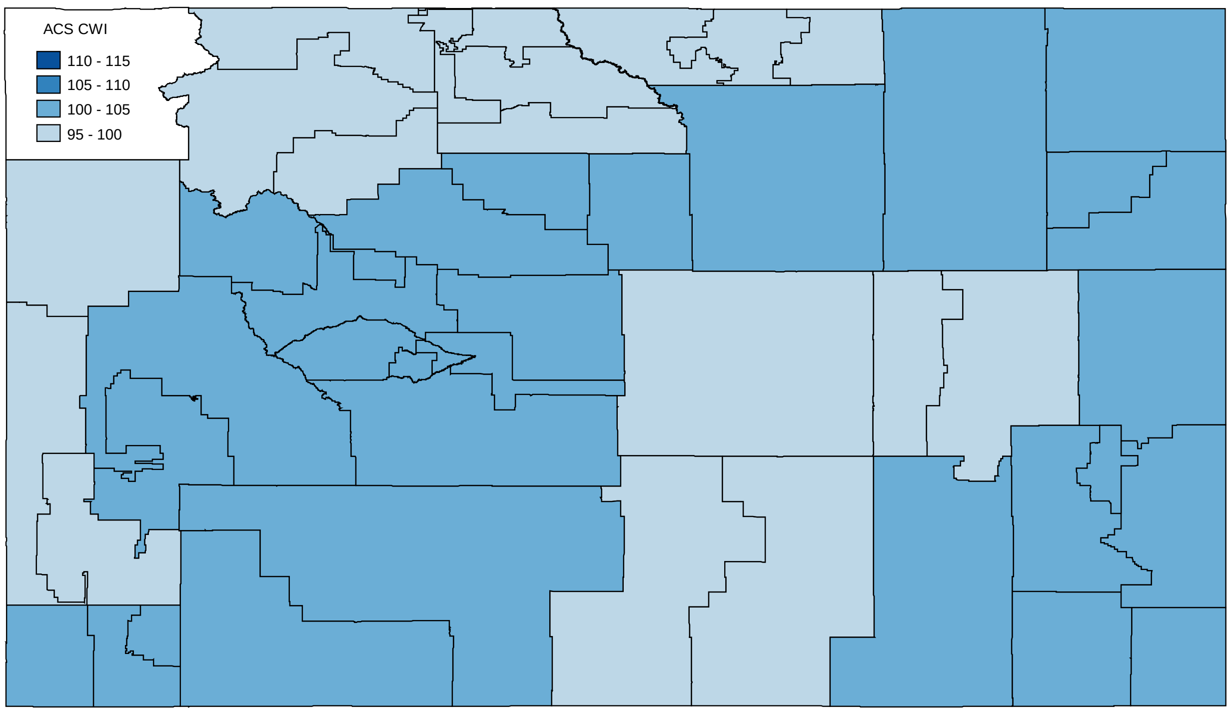
The disadvantage to using the ACS to estimate a CWI is that the level of geographic detail is low. To protect the privacy of the survey respondents, the Census Bureau only provides geographic information about "place-of-work areas." Place-of-work areas are geographic regions designed to contain at least 100,000 persons. There are only five ACS place of work areas in Wyoming.

[20] For more on the estimation of the NCES CWI, see Taylor and Fowler (2006).

Figure 5 illustrates the ACS CWI for Wyoming. It was estimated using data from the 2012 and 2013 ACS, which is the most recent data available. See Appendix B for details on the data and estimation.

As the figure illustrates, the ACS CWI indicates much less variation in regional cost than does the WCLI or the 2015 Wyoming HWI. The index values range from 96 in the northwestern counties to 104 in Campbell County and other northeastern counties. In other words, the ACS CWI indicates that the labor cost differs by less than 9 percent from the lowest cost district to the highest cost district across Wyoming. The ACS CWI also identifies Teton County as a low cost rather than high cost location. This unexpected pattern probably arises because a single place-of-work area contains both Teton County and Big Horn County, and the demographically adjusted average wage for the place-of-work area as a whole is not a good fit for either county individually.

Figure 5: The ACS CWI, 2015



Source: Author's calculations using the American Community Surveys for 2012 and 2013.

The second strategy for estimating a CWI for Wyoming relies on data from the OES. The OES is a BLS database that contains average annual earnings by occupation for states and metropolitan areas. Each year, the BLS—in partnership with state workforce agencies—samples and contacts approximately 400,000 civilian, nonfarm establishments for the OES.

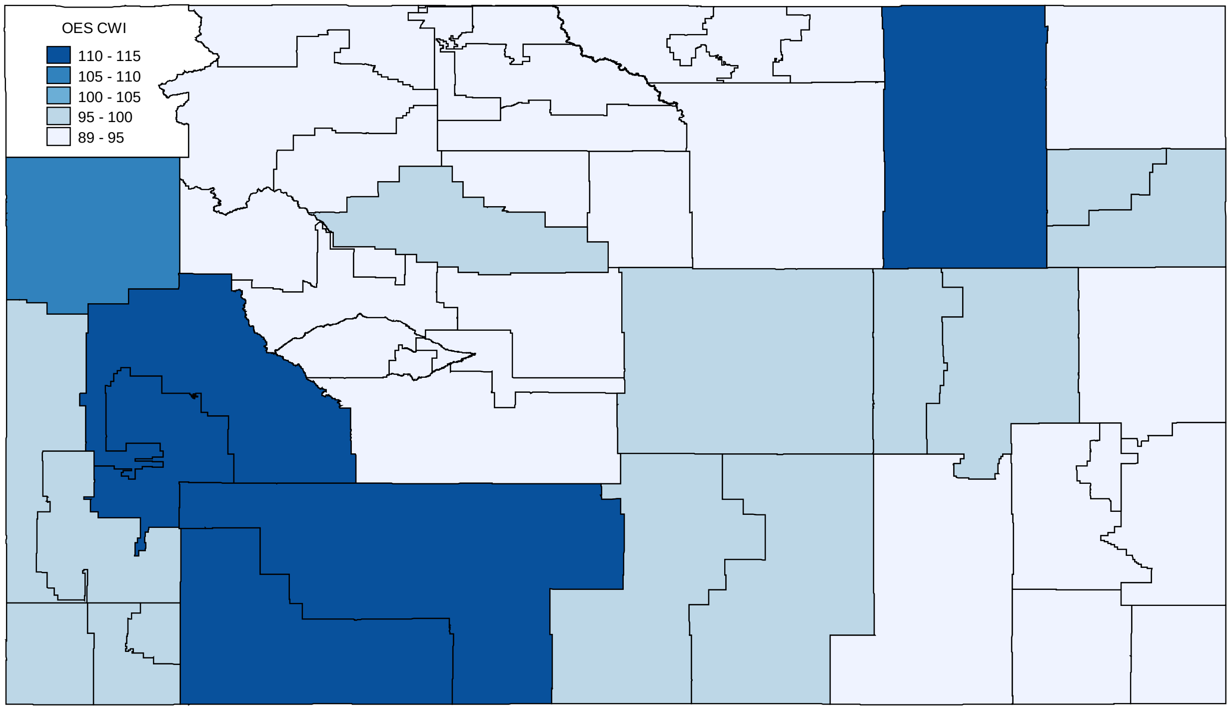
More importantly, the Wyoming Department of Workforce Services provides OES data at the county level. The data are not as detailed for small counties as they are for larger ones because privacy concerns lead to the suppression of occupational detail. Nevertheless, the level of geographic detail is unmatched.

The disadvantage to using the OES to construct a CWI is that the OES does not have any data on the demographic characteristics of workers. It is not possible to adjust for regional differences in educational attainment or to limit the sample to college graduates. It is possible to limit the analysis to occupations that are commonly held by college graduates, but only in locations with fine-grained details on specific occupations. Such data are not available for most Wyoming counties. Therefore, in order to produce estimates for all Wyoming counties, it is necessary to include all available occupations. As such, there is a somewhat higher risk that systematic differences between the teacher population and the non-educator population (in terms of educational background or tastes for local amenities) could lead the OES CWI to overstate (or understate) the wage differentials that teachers would require in specific locations.

Figure 6 illustrates the OES CWI. It is available at the county level, and was estimated using data from the 2014 OES survey.[21] The 2014 OES database incorporates survey information from employer surveys conducted in 2012, 2013 and 2014.

[21] The OES CWI for each county is the predicted wage for each county, divided by the employment-weighted, state average predicted wage and then multiplied by 100. Following the methodology in Taylor and Fowler (2006), the wage predictions used to construct the OES CWI are the least squares means or population marginal means from a regression of the average annual earnings (in logs) on indicator variables for occupation and location, weighted by total employment in the occupation/location cell. Here, the data come from all Wyoming counties and all metropolitan areas and non-metropolitan areas elsewhere in the country. Including data from other states has the effect of estimating Wyoming wage levels as deviations from the national average, by occupation, and ensures that occupations observed in only one or two Wyoming counties are not dropped from the analysis. Because some Wyoming counties lack occupational detail, the estimation includes major occupation groups as well as detailed occupations. Including major occupation groups means that the analysis cannot fully control for differences in occupational mix because it cannot control for differences in the mix within major occupation groups. Restricting the analysis only to major occupation groups yields very similar estimates for the OES CWI in Wyoming. The correlation between the two versions is 0.994.

Figure 6: The OES CWI, 2015



Source: Author's calculations from OES data.

Table 8 presents descriptive statistics on the ACS CWI and the OES CWI. As the table illustrates, the county-level OES CWI ranges from 89 (in Goshen County) to 115 (in Campbell County) thus suggesting that the cost of hiring teachers varies by as much as 29 percent from one Wyoming school district to another.

Table 8: Comparing the ACS CWI with the OES CWI

	Mean	Std. Deviation	Minimum	Maximum
ACS CWI	100.1	2.94	96	104
OES CWI	97.4	6.34	89	115

Clearly, the OES CWI is a better CWI for Wyoming than the ACS CWI. It is available at the county level and more consistent with reasonable beliefs about Wyoming labor costs. The OES CWI cannot control for the age or educational attainment of the labor force, so there is some risk of bias in the estimates. Nevertheless, the OES CWI represents a viable option for regional cost adjustment in Wyoming.

Exploring the Implications

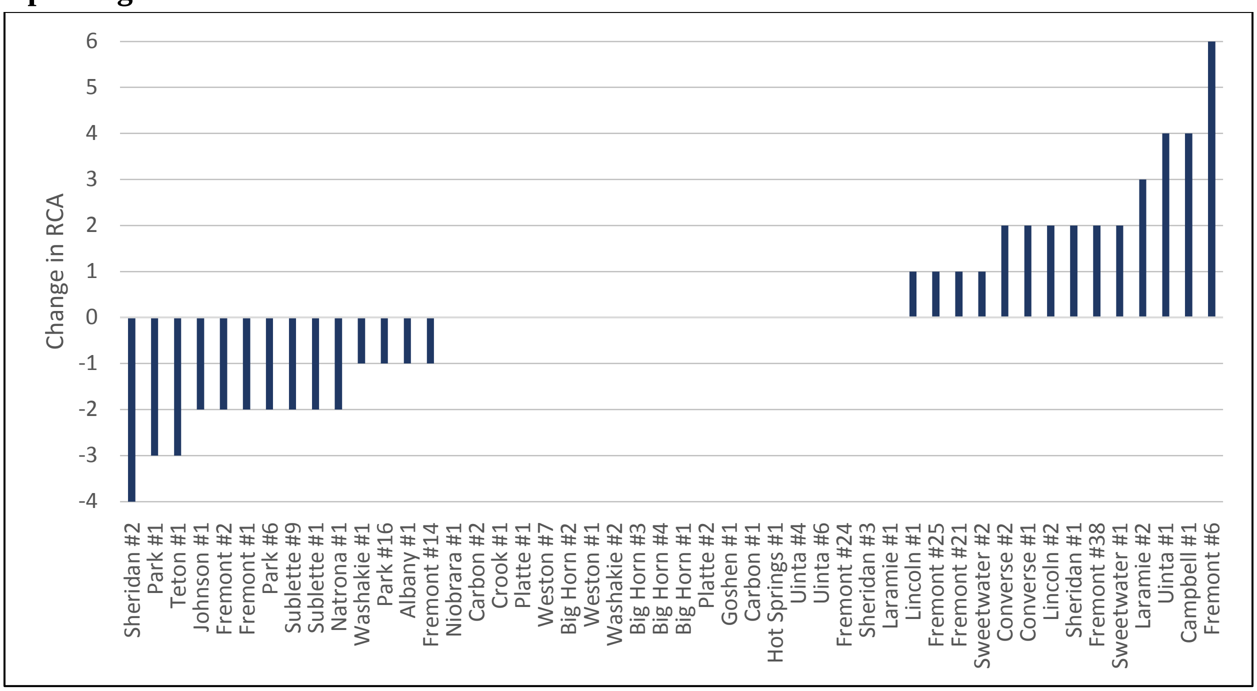
Updating the RCA could substantially alter the distribution of state aid to Wyoming school districts. Arguably, any of three indices—the reweighted WCLI, the 2015 Wyoming HWI or the OES CWI could be used to make regional cost adjustments. However, the three most likely scenarios are that either:

1. The reweighted WCLI and the 2015 Wyoming HWI would simply replace the existing WCLI and HWI in the calculation of the RCA. Thus, the updated RCA would be the larger of the WCLI with Class D weights, the 2015 Wyoming HWI or 100. Or,
2. The 2015 Wyoming HWI would replace the RCA. Or,
3. The OES CWI would replace the RCA.

Appendix C lists the current and updated RCA under each scenario for each Wyoming district.

Figure 6 illustrates how reweighting the WCLI and updating the HWI would change the RCA. As the figure shows, 20 Wyoming school districts would be completely unaffected. Fourteen districts would experience a decrease in their RCA, and 14 districts would experience an increase. Fremont County School District #6 would see their RCAs increase by 6 percentage points if the components of the statutory RCA were updated. Campbell County School District #1 and Uinta County School District #1 would also experience large percentage point gains. Sheridan County School District #2, Park County School District #1 and Teton County School District #1 would experience the largest percentage point declines.

Figure 6: The Changes in the Statutory RCA Arising From Reweighting the WCLI and Updating the HWI



Source: Author's calculations.

After reweighting and updating, 23 of the 48 school districts in Wyoming would have their RCA based on the 2015 Wyoming HWI. Seventeen districts would have their RCA set to 100 despite below average labor costs. The RCA for eight school districts (including Teton County School District #1) would be based on the reweighted WCLI.

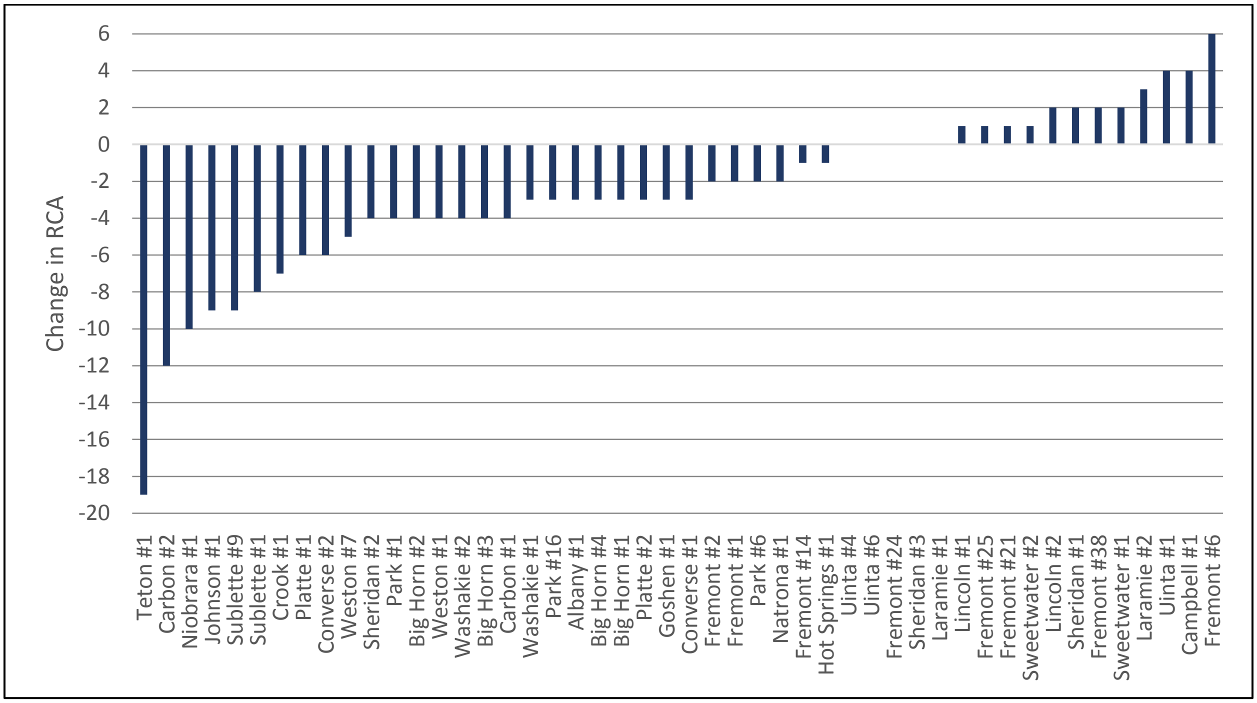
Unfortunately, defining the RCA as the greater of three alternatives—the WCLI, the HWI or 100—has unintended consequences for school funding equity in Wyoming that will not be resolved simply by reweighting the WCLI and updating the HWI. From a strict equity perspective, continuing to apply the regional cost index only to districts with above-average costs will overfund more than one third of the school districts in Wyoming. Continuing to offer the WCLI option will also overfund some districts, because any cost of living index—even the reweighted WCLI—overstates the cost of hiring in locations that have attractive amenities.

One solution is to use the 2015 Wyoming HWI as the sole source of regional cost adjustment. The 2015 Wyoming HWI is a direct measure of regional variations in the cost of educator labor. It represents a significant improvement on the 2005 Wyoming HWI, which has become badly outdated.

If the Legislature were to adopt the 2015 Wyoming HWI as the RCA, it would not be desirable to apply the regional cost adjustment only to districts with above average costs. Regional cost adjustments exist to equalize the purchasing power of school districts. If one district has labor costs that are 5 percent higher than another, then it should receive more funding than the other, even if both have below average costs. Rounding all the districts up to the state average defeats the purpose of regional cost adjustments and can exacerbate inequalities in the system.

Figure 7 illustrates the changes that would occur if the 2015 Wyoming HWI were adopted as the RCA for all Wyoming school districts. Not surprisingly, allowing RCA values below 100 would lower the RCA for many school districts. However, the biggest declines in the RCA would be for districts where the WCLI is particularly high. The biggest beneficiaries of replacing the statutory RCA with the 2015 Wyoming HWI would be districts in Campbell, Fremont and Uinta counties.

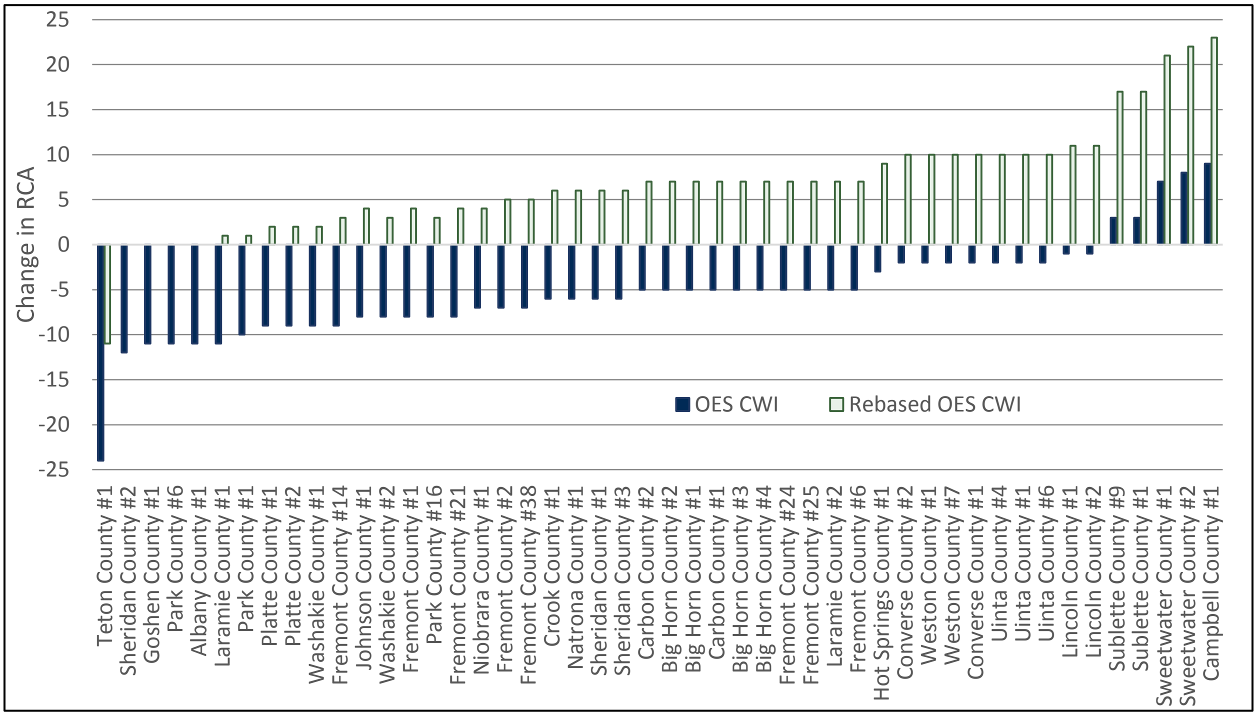
Figure 7: The Changes in the RCA Implied by Using the 2015 Wyoming HWI as the RCA for All Districts



Source: Author's calculations.

Figure 8 illustrates the change that would occur under the third likely scenario—replacing the RCA with the OES CWI for all Wyoming school districts. Again, it would not be desirable to apply the RCA only to districts with above average costs, and allowing RCA values below 100 lowers the RCA for many school districts. Unless the OES CWI were rebased (which is always an option) only a handful of districts in Campbell, Sweetwater and Sublette Counties would experience an increase in their RCA. However, if the OES CWI were rebased so that 100 equaled the state minimum rather than the state average, then the RCA would increase for all but a handful of districts (most notably Teton County #1).

Figure 8: The Changes in the RCA Implied by Using the OES CWI as the RCA for All Districts



Source: Author's calculations.

Conclusions

Wyoming is one of the few states in the nation to adjust its school finance formula to reflect regional variations in the cost of education. This analysis suggests that the cost of education varies widely within the state, offering strong support for continuing such adjustments.

Although any of the three options discussed above would represent an improvement over the status quo, I recommend that the Wyoming Legislature consider replacing the current, three-way design of the RCA with the OES CWI. The OES CWI has a number of attractive features. It is clearly outside of school district influence, eliminating the risk that the regional cost index would misidentify high spending districts as high cost ones. It reflects not only regional differences in cost of living, but also differences in local amenities. The CWI methodology is also the most common approach to regional cost adjustment in other states.

If the OES CWI were rebased so that 100 equaled the state minimum, then most Wyoming school districts would benefit from the change to the OES CWI. Only a handful of districts—most notably Teton County #1—would experience a decline in their RCA. Furthermore, by properly calibrating the salary used in the funding model calculations, this change in the RCA could be accomplished with only a limited budgetary impact.

Whichever option the Legislature chooses, I also recommend that it put in place a mechanism for regular updates to the RCA. The Wyoming economy is dynamic and labor market conditions in Wyoming are constantly changing. For the RCA to work as intended, it must accurately reflect current differences in labor cost, and not be allowed to drift out of date.

Bibliography

Baker, Bruce D. 2005. Development of an Hedonic Wage Index for the Wyoming School Funding Model, in *An Evidence-Based Approach To Recalibrating Wyoming's Block Grant School Funding Formula*, a report prepared for the Wyoming Legislative Select Committee on Recalibration by Lawrence O. Picus and Associates. Retrieved July 19, 2011 from http://legisweb.state.wy.us/2009/interim/schoolfinance/WYRecalibration.pdf.

Chambers, J.G. (1998). Geographic Variations in Public Schools' Costs (NCES 98-04). U.S. Department of Education. Wyoming, DC: National Center for Education Statistics Working Paper.

Chambers, Jay G. 1997. *Geographic Variations in Public School Costs*. Washington, D.C.: U.S. Department of Education, National Center for Education Statistics.

Chambers, Jay G. 1995. "Public School Teacher Cost Differences Across the United States: Introduction to a Teacher Cost Index (TCI)" [online] Retrieved November 22, 1999, from http://nces.ed.gov/pubs/96344cha.htm.

Corona Insights (2014). 2013 Colorado school district cost of living study. Retrieved March 31, 2015 from http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1251990492659&ssbinary=true.

Drukker, D. M. 2003. Testing for serial correlation in linear panel-data models. Stata Journal (3)2: 168-177.

Goldhaber, D.D. (1999). An Alternative Measure of Inflation in Teacher Salaries. In W.J. Fowler, Jr. (Ed.), Selected Papers in School Finance, 1997–99 (NCES 1999-334) (pp. 29–54). U.S. Department of Education. Wyoming, DC: National Center for Education Statistics.

Guthrie, James, and Richard Rothstein. 1999. Enabling 'adequacy' to achieve reality: Translating adequacy into state school finance distribution arrangements. In *Equity and adequacy in education finance*, edited by H.F. Ladd, R. Chalk, and J.S. Hansen. Washington, D.C.: National Academy Press, pp. 209–59.

Hanushek, Eric A. 1999. Adjusting for differences in the costs of educational inputs. In *Selected papers in school finance*, 1997–99, edited by W.J. Fowler, Jr.. Washington, D.C.: National Center for Education Statistics, pp. 13–28.

McMahon, Walter W. 1994. Intrastate cost adjustments. In *Selected papers in school finance, 1994*, edited by W.J. Fowler, Jr.. Washington, D.C.: National Center for Education Statistics, pp. 93–114.

Rothstein, Richard and James R. Smith. 1997. *Adjusting Oregon Education Expenditures for Regional Cost Differences: A Feasibility Study*. Sacramento, CA: Management Analysis & Planning Associates, L.L.C.

Ruggles, Steven, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. 2015. Integrated Public Use Microdata Series: Version 6.0 [Machine-readable database]. Minneapolis: University of Minnesota.

Stoddard, Christiana. 2005. Adjusting Teacher Salaries for the Cost Of Living: The Effect on Salary Comparisons and Policy Conclusions. *Economics of Education Review* 24 (2005) 323–339.

Taylor, L.L. forthcoming. "Equality is Not Equity: Regional Cost Differences and the Real Allocation of Educational Resources," in *Legal Frontiers in Education: Complex Law Issues for Leaders, Policymakers and Policy Implementers*, Anthony H. Normore, Patricia Ehrensal, Patricia First, and Mario Torres, editors.

Taylor, L.L. 2014. "Comparable Wage Index," in *Encyclopedia of Education Economics and Finance*, Dominic J. Brewer and Lawrence O. Picus, editors (SAGE).

Taylor, L.L. 2011. "Updating the Wyoming Hedonic Wage Index," A report prepared for the Wyoming Joint Appropriations and Joint Education Committees.

Taylor, L.L. 2010. Putting Teachers in Context: A Comparable Wage Analysis of Wyoming Teacher Salaries. A report prepared for the Select Committee on School Finance Recalibration.

Taylor L.L. 2008. Washington Wages: An Analysis of Educator and Comparable Non-educator Wages in the State of Washington, A report to the Joint Task Force on Basic Education Finance. Retrieved December 1, 2010 from http://www.leg.wa.gov/JointCommittees/BEF/Documents/Mtg11-10_11-08/WAWagesDraftRpt.pdf.

Taylor, L.L. 2008. Comparing Teacher Salaries: Insights from the U.S. Census. *Economics of Education Review*, 27(1): 48-57.

Taylor, L.L. 2006. Comparable Wages, Inflation and School Finance Equity. *Education Finance and Policy*. 1(3): 349-71.

Taylor, L.L., and W.J. Fowler, Jr.. 2006. A comparable wage approach to geographic cost adjustment NCES 2006–321. Wyoming, D.C.: National Center for Education Statistics.

Willmarth, Matthew, Michael Goetz, Lawrence O. Picus and Allan Odden. 2008. The Wyoming Funding Model: Guidebook and Technical Specifications. Cheyenne, WY: The Wyoming Department of Education.

Wooldridge, J. M. 2002. Econometric Analysis of Cross Section and Panel Data. Cambridge, MA: MIT Press.

The Wyoming Department of Administration & Information, Division of Economic Analysis. 1999. *The Wyoming Cost of Living Index Policies & Procedures*. Cheyenne, WY: Wyoming. Department of Administration & Information. Retrieved July 19, 2011 from http://eadiv.state.wy.us/wcli/policies.pdf.

Appendix A: The Hedonic Wage Models

Table A1 presents coefficient estimates and robust standard errors for three alternative hedonic wage models. The first model incorporates individual fixed effects for teachers. The second model incorporates random effects for teachers, assuming an auto regressive (AR1) error structure. The third model replicates the second, but is estimated excluding data from Teton County School District #1.

Appendix Table A: Alternative Specifications of the Hedonic Wage Model

	Fixed Effect Model	AR Random Effects Model	AR RE Model Excluding Teton
MA	0.0453	0.0574	0.0565
	(0.0020)**	(0.0009)**	(0.0009)**
PhD	0.0520	0.0785	0.0780
	(0.0172)**	(0.0067)**	(0.0067)**
BA from University of WY	0.0037	-0.0032	-0.0014
	(0.0056)	(0.0014)*	(0.0014)
Education major	-0.0059	-0.0057	-0.0058
	(0.0014)**	(0.0009)**	(0.0009)**
District experience (log)	-0.0080	-0.0264	-0.0261
	(0.0026)**	(0.0012)**	(0.0012)**
District experience (log), sq.	0.0047	0.0154	0.0151
	(0.0018)*	(0.0004)**	(0.0004)**
Total experience (log)	0.0596	0.0906	0.0926
	(0.0030)**	(0.0010)**	(0.0011)**
New teacher	0.0358	0.0395	0.0403
	(0.0023)**	(0.0013)**	(0.0013)**
Non-teaching assignments			
Administration	0.0194	0.0243	0.0241
	(0.0027)**	(0.0016)**	(0.0016)**
Advisor/sponsor	0.0255	0.0255	0.0257
	(0.0011)**	(0.0007)**	(0.0007)**
Assistant coach	0.0020	0.0016	0.0017
	(0.0016)	(0.0010)	(0.0010)
Classified	0.0249	0.0238	0.0240
	(0.0060)**	(0.0033)**	(0.0033)**
Coach	0.0015	-0.0006	-0.0007
	(0.0020)	(0.0013)	(0.0013)
Head teacher	0.0328	0.0263	0.0251
	(0.0055)**	(0.0027)**	(0.0027)**
Principal	0.1036	0.1425	0.1257
	(0.0015)**	(0.0242)**	(0.0257)**
Support	0.0147	0.0163	0.0163
	(0.0080)	(0.0031)**	(0.0031)**
Tutor	0.0515	0.0454	0.0377
	(0.0079)**	(0.0037)**	(0.0050)**

Appendix Table A: Alternative Specifications of the Hedonic Wage Model

	Fixed Effect Model	**AR Random Effects Model**	**AR RE Model Excluding Teton**
Teaching assignments			
Arts	-0.0071	0.0041	0.0056
	(0.0110)	(0.0031)	(0.0031)
Elementary grades	-0.0038	-0.0026	-0.0021
	(0.0039)	(0.0021)	(0.0021)
English/language arts	-0.0068	0.0014	0.0022
	(0.0041)	(0.0023)	(0.0024)
Bilingual/ ESL	-0.0165	-0.0048	-0.0083
	(0.0076)*	(0.0048)	(0.0054)
Fine Arts	0.0072	-0.0008	-0.0009
	(0.0094)	(0.0041)	(0.0042)
Health & P.E.	-0.0043	-0.0066	-0.0061
	(0.0067)	(0.0029)*	(0.0029)*
Math	0.0074	-0.0000	0.0001
	(0.0064)	(0.0026)	(0.0026)
Science	-0.0088	0.0020	0.0013
	(0.0072)	(0.0031)	(0.0031)
Special Education	-0.0047	0.0036	0.0051
	(0.0049)	(0.0024)	(0.0025)*
Social science	-0.0007	-0.0074	-0.0077
	(0.0052)	(0.0028)**	(0.0029)**
Vo-tech	-0.0027	0.0112	0.0120
	(0.0077)	(0.0029)**	(0.0029)**
Contract days	0.3529	0.3985	0.3827
	(0.1056)**	(0.0271)**	(0.0271)**
Elementary school	0.0003	0.0114	0.0102
	(0.0047)	(0.0029)**	(0.0029)**
High school	0.0067	0.0213	0.0200
	(0.0055)	(0.0032)**	(0.0032)**
K-12 school	-0.0047	0.0105	0.0104
	(0.0119)	(0.0047)*	(0.0047)*
Middle school	0.0010	0.0165	0.0154
	(0.0053)	(0.0031)**	(0.0031)**
Other school type	-0.0043	0.0108	0.0097
	(0.0055)	(0.0033)**	(0.0033)**
Large school	-0.0047	-0.0007	-0.0000
	(0.0022)*	(0.0015)	(0.0015)
Black		-0.0015	-0.0006
		(0.0157)	(0.0157)
Hispanic		0.0030	0.0038
		(0.0068)	(0.0068)
Indian		-0.0306	-0.0253
		(0.0092)**	(0.0092)**

Appendix Table A: Alternative Specifications of the Hedonic Wage Model

	Fixed Effect Model	**AR Random Effects Model**	**AR RE Model Excluding Teton**
Female		-0.0025	-0.0029
		(0.0017)	(0.0017)
WCLI	0.0012	0.0023	0.0017
	(0.0002)**	(0.0001)**	(0.0002)**
OES CWI	0.0051	0.0041	0.0040
	(0.0005)**	(0.0001)**	(0.0001)**
County pop. density (log)	0.0597	0.0659	0.0658
	(0.0054)**	(0.0012)**	(0.0012)**
Distance to a 50,000 city	0.0003	0.0004	0.0005
	(0.0001)**	(0.0000)**	(0.0000)**
Distance to a 15,000 city	0.0007	0.0008	0.0007
	(0.0002)**	(0.0000)**	(0.0000)**
Nearest hospital > 25 miles	-0.0412	-0.0455	-0.0424
	(0.0097)**	(0.0023)**	(0.0024)**
Percent free lunch	0.0018	0.0020	0.0021
	(0.0005)**	(0.0004)**	(0.0005)**
Percent free lunch * WCLI	-0.00002	-0.00002	-0.00002
	(0.0000)**	(0.0000)**	(0.0000)**
Percent ELL	0.0003	0.0002	-0.0001
	(0.0001)**	(0.0001)*	(0.0001)
Percent special education	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)
School year 2010-11	-0.0604	-0.0360	-0.0365
	(0.0023)**	(0.0007)**	(0.0007)**
School year 2011-12	-0.0380	-0.0198	-0.0198
	(0.0018)**	(0.0006)**	(0.0006)**
School year 2012-13	-0.0296	-0.0172	-0.0174
	(0.0012)**	(0.0005)**	(0.0005)**
School year 2013-14	-0.0225	-0.0164	-0.0167
	(0.0007)**	(0.0004)**	(0.0004)**
Number of observations	35,018	35,018	33,996
Number of individual teachers	9,678	9,678	9,393

*Note: The dependent variable for both models is the log of total annual salary. Robust standard errors are in parentheses. The robust standard errors for the fixed effects model have been clustered by teacher; clustering is not appropriate for the AR random effects specifications. The AR random effects models were estimated using REML and an AR1 error structure. The asterisks indicate a coefficient that is * significant at 5%; ** significant at 1%.*

Appendix B: An ACS-CWI for Regional Cost Adjustment in Wyoming

The basic premise of a CWI is that all types of workers demand higher wages in areas with a higher cost of living or a lack of amenities. One should be able to measure the effect on teacher wages of differences in amenities and the cost of living by observing systematic variations in the earnings of comparable workers who are not educators. Intuitively, if Laramie construction workers are paid 5 percent less than the national average construction wage, Laramie engineers are paid 5 percent less than the national average engineering wage, Laramie nurses are paid 5 percent less than the national average nursing wage, and so on, then the best estimate of the cost of hiring teachers in Laramie is also 5 percent less than the national average.

The NCES CWI measures the prevailing wage for college graduates in 800 U.S. labor markets. The baseline estimates (for 1999) come from a regression analysis of the individual earnings data from the 2000 U.S. Census. Annual updates to that baseline come from regression analyses of occupational earnings data provided by the U.S. Bureau of Labor Statistics (BLS).

This analysis updates the NCES CWI using the American Community Survey (ACS). The ACS, which is conducted annually by the U.S. Census Bureau, has replaced the decennial census as the primary source of demographic information about the U.S. population. It provides information about the earnings, age, occupation, industry, and other demographic characteristics for millions of U.S. workers. The ACS-CWI measures earnings differences for college graduates.

Like the NCES CWI, the ACS-CWI is derived from a regression analysis of individual earnings data. Workers with incomplete data and workers without a college degree were excluded from the ACS regression analysis, as was anyone who had a teaching or educational administration occupation or who was employed in the elementary and secondary education industry. Self-employed workers were excluded because their reported earnings may not represent the market value of their time. Individuals who reported working less than half time or for more than 90 hours a week were also excluded, as were workers under the age of 18 and over the age of 80. Finally, individuals employed outside the United States were excluded because their earnings may represent compensation for foreign travel or other working conditions not faced by domestic workers.

The ACS-CWI is estimated from nationwide data because the national sample is much larger and yields much more precise estimates of wages by industry and occupation than could be generated using only the ACS data for the state of Wyoming. For similar reasons, the analysis combines data from the two most recent ACS reports (2012 and 2013). Data from before 2012 could not be incorporated into the analysis because the Census Bureau has changed the way it defines geographic areas, making the publically available data for 2012 a poor match for the publically available data from earlier years.

As with the NCES CWI, the labor markets in the ACS CWI are based on "place-of-work areas" as defined by the Census Bureau for the 2012 ACS. Place-of-work areas are geographic regions designed to contain at least 100,000 persons. The place-of-work areas do not cross state boundaries and generally follow the boundaries of county groups, single counties, or census-defined places (Ruggles et al. 2015). Counties in sparsely-populated parts of a state are clustered together into a single place-of-work area. Each labor market in the ACS CWI is either a single place of work, or a cluster of the places-of-work that comprise a metropolitan area. There are five ACS place of work areas in Wyoming.

Table B.1 presents the results from the regression analysis underpinning the ACS-CWI. The dependent variable in each case is the log of annual wage and salary earnings. Key independent variables include the age, gender, race, educational attainment, language ability and amount of time worked for each individual in the nationwide sample. The model includes the interaction between gender and age, to allow for the possibility that men and women have different career paths, and therefore different age-earnings profiles. In addition, the estimation includes indicator variables for occupation and industry for each year. This specification allows wages to rise (or fall) more slowly in some occupations or industries than it does in others. Finally, the regression model includes indicator variables for each labor market area and random effects for states.[22]

As the table illustrates, the estimated model is consistent with reasonable expectations about labor markets. Wage and salary earnings increase with the amount of time worked per week and the number of weeks worked per year. Earnings also rise as workers get older, but the increase is more rapid for men than for women (perhaps because age is not as good an indicator of experience for women as it is for men). Workers with advanced degrees earn systematically more than workers with a bachelor's degree. Whites earn systematically more than apparently comparable individuals from other racial groups. College-educated workers who do not speak English well earn substantially less than other workers, all other things being equal.

The predicted wage level in each labor market area captures systematic variations in labor earnings while controlling for demographics, industrial and occupational mix, and amount of time worked.[23] Dividing each local wage prediction by the state average prediction for Wyoming yields the ACS-CWI for each of the five Wyoming place of work areas, and therefore for the corresponding Wyoming school districts. Appendix C presents the ACS-CWI for each Wyoming school district.

[22] Treating state effects as random rather than fixed ensures that the predicted wage is the same in Kansas City, Kansas as it is in Kansas City, Missouri, while allowing for a correlation in the errors among labor markets within any given state.

[23] Formally, the predicted wage level in each market is the least-squares mean for the market fixed effect. The least-squares mean (or population marginal mean) is defined as the expected value of the mean for each effect (in this context, each market) that you would expect from a balanced design holding all covariates at their mean values and all classification variables (such as occupation or gender) at their population frequencies.

Table B.1: Estimating the ACS-CWI

	ACS-CWI Model	
Explanatory Variables	**Estimate**	**Standard Error**
Usual hours worked per week	0.9281	0.0029
Worked 27-39 weeks	-0.566	0.004
Worked 40-47 weeks	-0.259	0.004
Worked 48-49 weeks	-0.097	0.005
Female	0.314	0.017
Age	0.088	0.001
Age, squared	-0.001	0.000
Female*age	-0.017	0.001
Female*age, squared	0.000	0.000
Not an English speaker	-0.520	0.030
Bachelor's degree	-0.219	0.004
Master's degree	-0.101	0.004
Professional degree	0.000	
Doctoral degree	0.064	0.005
Hispanic	-0.097	0.003
American Indian	-0.085	0.012
Black	-0.129	0.003
Chinese	-0.104	0.004
Japanese	-0.074	0.010
Other Asian/pacific islander	-0.092	0.003
Other race, n.e.c.	-0.077	0.007
Mixed race	-0.081	0.005
White	0.000	
Industry*year indicators?	Yes	
Occupation * year indicators?	Yes	
Labor market indicators?	Yes	
Number of observations	536,841	

Source: Ruggles et al. (2015) and author's calculations.

Appendix C: Index Values for Regional Cost Adjustment

School District	2015-16 WCLI	Reweighted 2015-16 WCLI	2005 HWI	2015 HWI	OES CWI	ACS CWI	2015-16 RCA	Updated and Reweighted RCA	Rebased 2015 HWI	Rebased OES CWI
Albany #1	100	99	101	98	90	101	101	100	109	101
Big Horn #1	89	92	98	97	95	96	100	100	109	107
Big Horn #2	89	92	100	96	95	96	100	100	107	107
Big Horn #3	89	92	99	96	95	96	100	100	107	107
Big Horn #4	89	92	99	97	95	96	100	100	108	107
Campbell #1	105	104	106	110	115	104	106	110	123	129
Carbon #1	102	102	101	98	97	99	102	102	109	109
Carbon #2	102	102	98	90	97	99	102	102	101	109
Converse #1	102	104	96	99	100	99	102	104	110	112
Converse #2	102	104	94	96	100	99	102	104	107	112
Crook #1	93	95	97	93	94	104	100	100	104	106
Fremont #1	99	99	103	101	95	101	103	101	112	107
Fremont #2	99	99	102	100	95	101	102	100	111	107
Fremont #6	99	99	100	106	95	101	100	106	118	107
Fremont #14	99	99	104	103	95	101	104	103	115	107
Fremont #21	99	99	103	104	95	101	103	104	116	107
Fremont #24	99	99	99	100	95	101	100	100	112	107
Fremont #25	99	99	100	101	95	101	100	101	113	107
Fremont #38	99	99	102	104	95	101	102	104	115	107
Goshen #1	90	91	95	97	89	104	100	100	108	100
Hot Springs #1	92	93	100	99	97	101	100	100	111	109
Johnson #1	99	100	102	93	94	104	102	100	104	106
Laramie #1	98	98	106	106	95	101	106	106	119	107
Laramie #2	98	98	95	103	95	101	100	103	115	107
Lincoln #1	96	95	97	101	99	96	100	101	112	111
Lincoln #2	96	96	98	102	99	96	100	102	113	111
Natrona #1	101	100	106	104	100	99	106	104	116	112
Niobrara #1	88	90	94	90	93	104	100	100	100	104

School District	2015-16 WCLI	Reweighted 2015-16 WCLI	2005 HWI	2015 HWI	OES CWI	ACS CWI	2015-16 RCA	Updated and Reweighted RCA	Rebased 2015 HWI	Rebased OES CWI
Park #1	96	97	103	99	93	96	103	100	110	104
Park #6	96	97	104	102	93	96	104	102	114	104
Park #16	96	97	101	98	93	96	101	100	110	104
Platte #1	87	89	95	94	91	104	100	100	105	102
Platte #2	87	89	93	97	91	104	100	100	108	102
Sheridan #1	101	101	98	103	95	96	101	103	115	107
Sheridan #2	101	101	107	103	95	96	107	103	115	107
Sheridan #3	101	101	99	101	95	96	101	101	113	107
Sublette #1	111	109	106	103	114	101	111	109	115	128
Sublette #9	111	109	103	102	114	101	111	109	113	128
Sweetwater #1	103	102	105	107	112	101	105	107	119	126
Sweetwater #2	103	102	104	105	112	101	104	105	117	126
Teton #1	132	129	118	113	108	96	132	129	126	121
Uinta #1	94	94	99	104	98	101	100	104	116	110
Uinta #4	94	94	99	100	98	101	100	100	112	110
Uinta #6	94	94	100	100	98	101	100	100	111	110
Washakie #1	93	94	101	98	92	104	101	100	109	103
Washakie #2	93	94	96	96	92	104	100	100	107	103
Weston #1	91	93	94	96	98	104	100	100	107	110
Weston #7	91	93	94	95	98	104	100	100	105	110

External Cost Adjustments for the Wyoming School Funding Model: 2015

Submitted to:

The Select Committee on School Finance Recalibration

Submitted by:

Dr. Lori L. Taylor

October 2015

Executive Summary

As part of the 2015 recalibration effort, consultants have constructed an evidence-based funding model using 1) a series of recommendations about the real resource needs of Wyoming school districts, and 2) the best-available estimates of the prices that must be paid to purchase those real resources. While those resource recommendations are not expected to change during the interval until the next recalibration, there is no guarantee that input prices will also remain unchanged. In order to prevent inflation from eroding the purchasing power of Wyoming school districts, an external cost adjustment (ECA) to the evidence-based funding model may be needed.

Since 2012, the Legislature has used four separate indices to monitor inflationary pressures and determine appropriate external cost adjustments, one for each of the four major components of the funding model—professional staff resources, non-professional staff resources, utilities and educational materials. I recommend that this approach to determining an ECA be continued.

Over the last five years, labor costs have been rising faster in Wyoming than in any other state except North Dakota, demonstrating not only the dynamism of the nation's energy producing regions, but also the inability of national labor cost indices to fully capture economic conditions at the local level. Therefore, a Wyoming-specific labor price index should be used for ECAs to the staff components of the funding model. I again recommend using an updated version of the National Center for Education Statistics' Comparable Wage Index (CWI) and the comparable wage index for high school graduates (HS-CWI) as the cost indices for professional staff resources and nonprofessional staff resources, respectively. Using the producer price index (PPI) for office supplies as the cost index for educational materials, and a composite energy index as the cost index for utilities are also recommended. However, the composite energy index should be revised to incorporate the PPI for gasoline as well as the PPIs for commercial electricity and natural gas.

When properly calibrated using an appropriate price index (such as those recommended here) ECAs do nothing more than maintain the status quo. Therefore, their appropriate role in the Wyoming funding model depends on the nature of the resource prices used to construct the evidence-based funding model. If the baseline price estimates are accurate, then applying an annual ECA is necessary to ensure that inflation does not affect the ability of school districts to purchase the recommended level of real resources. If the baseline price estimates overstate actual costs for one or more of the funding components, then applying an ECA to those funding components would simply perpetuate that overfunding, and the most appropriate policy response could be to forgo applying an ECA to those funding components until costs and funding converge. Similarly if a baseline price estimate understates actual costs for a funding component, then applying an ECA to that baseline estimate could keep the problem from getting worse, but would not eliminate the underfunding problem. Monitoring the situation for evidence that model prices overstate or understate actual costs seems prudent.

Introduction

As part of the 2015 recalibration effort, Picus Odden and Associates have identified the personnel, instructional materials, and other real resources each school district requires in order to provide "the basket" of educational goods and services every child in Wyoming should receive (Picus and Odden 2015). Their evidence-based funding recommendations represent their best estimates of the dollar amount each district needs to purchase those educational inputs.

As prices rise over time, the dollar amounts needed to purchase the recommended bundle of real resources will also rise. Without some mechanism for external cost adjustment (ECA), inflation will erode the purchasing power of school districts and could leave them unable to acquire the full quantity of recommended educational resources. Therefore, ECAs are crucial to the long term viability of any cost-based funding recommendation.

There are a number of existing price indices that could be used to measure year-to-year changes in the prices that school districts must pay for key educational resources. However, no single index reflects all of the inflationary pressures facing Wyoming school districts.

- The Consumer Price Index (CPI) and the Wyoming Cost of Living Index (WCLI) measure changes in the price of the things that consumers buy, not the things that school districts buy.[1] Changes in the price of housing, clothing and automobiles influence the CPI and WCLI because they influence the purchasing power of consumers, but changes in the price of such items have a negligible impact on school districts. Nevertheless, the CPI is frequently used as an inflation adjustment by the National Center for Education Statistics (NCES).
- The Employment Cost Index (ECI) for the Elementary and Secondary Education Industry measures national changes in the price of educator labor. If labor costs are growing more rapidly in some states or regions, the ECI cannot detect it. Furthermore, because the public sector dominates the industry, the ECI for Elementary and Secondary Education may be unduly influenced by the policy choices of other state governments. If, for example, states like New York and California respond to fiscal crises by freezing teacher salaries, then growth in the education industry's ECI may be artificially suppressed. The ECI is also purely a labor cost index. It does not provide any information about the price of non-labor items that are important to school districts such as energy and school supplies.[2]

[1] For more on the CPI, visit http://stats.bls.gov/cpi/ . For more on the WCLI, visit http://eadiv.state.wy.us/WCLI/Cost.html.
[2].For more on the ECI for the Elementary and Secondary Education Industry, visit http://stats.bls.gov/ncs/ect/.

- A comparable wage index modeled after the NCES Comparable Wage Index (CWI) can provide an estimate of changes in the price of college-educated labor at the state level, but, like the ECI, does not provide any information about the price of non-labor inputs. [3]
- The U.S. Bureau of Economic Analysis (BEA) publishes an index of educational costs that reflects three major components of school district purchases—labor, energy and educational materials—but it is national, not regional, and may not reflect important differences in cost pressure between Wyoming and the rest of the country.[4] Furthermore, price indices for the three major components are not available in a timely manner.

There is little reason to believe that the inflationary pressure coming from energy prices will be the same as the inflationary pressures coming from labor costs. Applying a single cost adjustment to the entire cost-based allocation of resources necessarily overcorrects some resource components and under corrects others. Therefore, since 2012, the Legislature has used four separate indices to monitor inflationary pressures and determine appropriate external cost adjustments to the evidence-based model, one for each of the four major components of the funding model—professional staff resources, non-professional staff resources, utilities and educational materials. I recommend that this approach to external cost adjustment be continued.

Resource Components of the Wyoming Funding Model

The Wyoming funding model supports four major types of school district spending—professional staff, nonprofessional staff, utilities, and educational materials. As Table 1 illustrates, just over two thirds of the educational resources in Wyoming are dedicated to professional staff such as teachers, administrators and librarians. Another 15 percent of the resources are dedicated to nonprofessional staff such as secretaries, custodians and groundskeepers. Less than 20 percent of funding model resources is dedicated to non-staff resources such as energy and educational materials.

[3] The CWI is not available from NCES for the years after 2005, but I have updated it through 2014 using the methodology I used to construct the NCES CWI. See Taylor (2011) for details about the update methodology. For more on the NCES CWI, see Taylor and Fowler (2006) or visit http://nces.ed.gov/edfin/adjustments.asp. For more on using comparable wage indices to measure inflation, see Goldhaber (1999) or Taylor (2006).

[4] For more on the BEA's Chain-Type Price Indexes for Intermediate Inputs by Industry, and its three sub-indices (the Chain-Type Price Indexes for Materials Inputs, Purchased Services and Energy Inputs) visit http://www.bea.gov/iTable/iTable.cfm?ReqID=51&step=1#reqid=51&step=51&isuri=1&5102=41.

Table 1: The Major Components of Educational Cost in Wyoming, 2015-16

	Percent of Legislative Funding Model Resources (less reimbursables)
Professional staff	68.5%
Nonprofessional staff	14.6%
Utilities	3.1%
Educational materials and other non-staff resources	13.8%

Source: Legislative Service Office.

Cost Indices for Professional and Nonprofessional Labor

In previous reports (Taylor 2010, 2011 and 2013) I recommended that the Wyoming Legislature use an updated version of the NCES Comparable Wage Index for college-educated workers as the ECA for professional labor, and a comparable wage index for high school graduates who have not completed college (HS-CWI) as the ECA for nonprofessional labor. I stand by those recommendations.

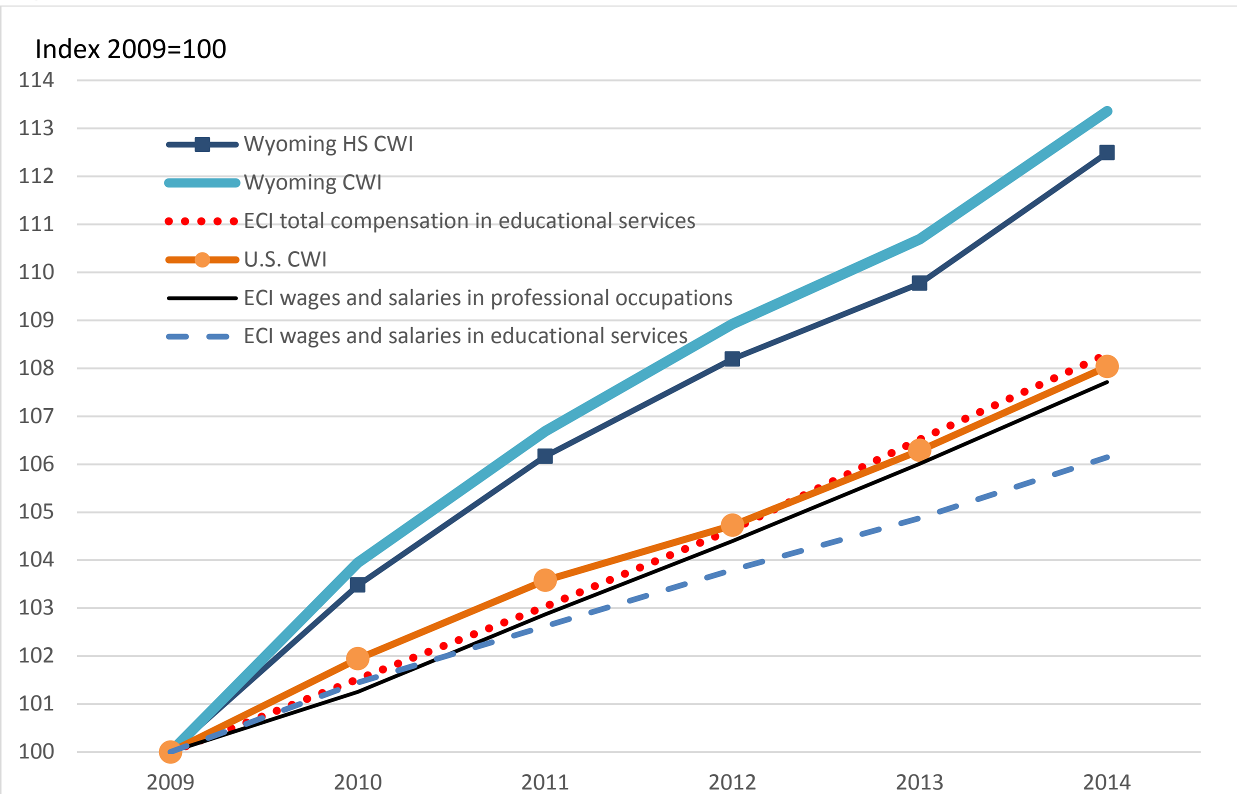
The CWI and HS-CWI are particularly attractive tools for making inflation adjustments to the labor components of the funding model for one simple reason: they are Wyoming-specific indices. Labor costs are determined locally, not nationally, and state-based price indices are likely to be more reflective of the cost pressures facing Wyoming school districts. The CWIs are also based on salary patterns among workers who are not educators so (unlike the ECI for elementary and secondary education) they reflect price pressures coming from outside of the educational system.

Figure 1 illustrates the relationship among a variety of labor cost indices: the ECI for total compensation in elementary and secondary education; the ECI for wages and salaries in elementary and secondary education; the ECI for wages and salaries in all professional occupations; the national CWI; the Wyoming CWI and the Wyoming HS-CWI. As the figure illustrates, the ECI for wages and salaries in elementary and secondary education has been growing more slowly than the corresponding ECI for total compensation (which includes benefits). Wages and salaries in elementary and secondary education have also been growing more slowly than wages and salaries in all professional occupations.

The national CWI, the national ECI for wages and salaries in professional occupations and the national ECI for total compensation in elementary and secondary education track each other very closely over the last five years. On average from 2009 through 2014, the national CWI increased 1.61 percent per year while the ECI for total compensation in elementary and secondary education increased 1.56 percent per year and the ECI for wages and salaries in professional occupations increased 1.50 percent per year. In other words, there is little difference between the CWI for college educated workers, the ECI for wages and salaries in professional occupations and the ECI for total compensation in elementary and secondary education at the national level. All three are telling the same story about labor costs.

The labor cost story in Wyoming is different. Recently, both the Wyoming CWI and the Wyoming HS CWI have been growing much more rapidly than the national average. According to the CWI and HS-CWI, labor costs have grown more in Wyoming than in any other state except for North Dakota over the last five years. Since 2009, the Wyoming CWI has grown 2.5 percent per year while the Wyoming HS CWI has grown 2.4 percent per year. Thus, the evidence suggests that national labor cost indices understate the inflationary pressure currently facing Wyoming school districts.

Figure 1: The Labor Cost Indices



Sources: U.S. Bureau of Labor Statistics, National Center for Education Statistics and author's calculations.

Cost Indices for Energy and Educational Materials

While labor costs can be heavily influenced by local conditions, the prices for energy and educational materials are largely determined at the national level. Therefore, national price indices are a good choice for cost adjustments for these model components. The BEA's price indices for energy and materials inputs for the educational services industry would seem the most appropriate candidates. Unfortunately, the BEA's price indices for educational materials and energy are not available in a timely manner, so alternative indices must be found.

The U.S. Bureau of Labor Statistics publishes a producer price index (PPI) for office supplies and accessories which closely tracks the BEA's Chain-Type Price Index for Materials Inputs for the educational services industry.[5] I recommend that the Wyoming Legislature continue using the PPI for office supplies and accessories as an ECA for the educational materials component of the evidence-based funding model.

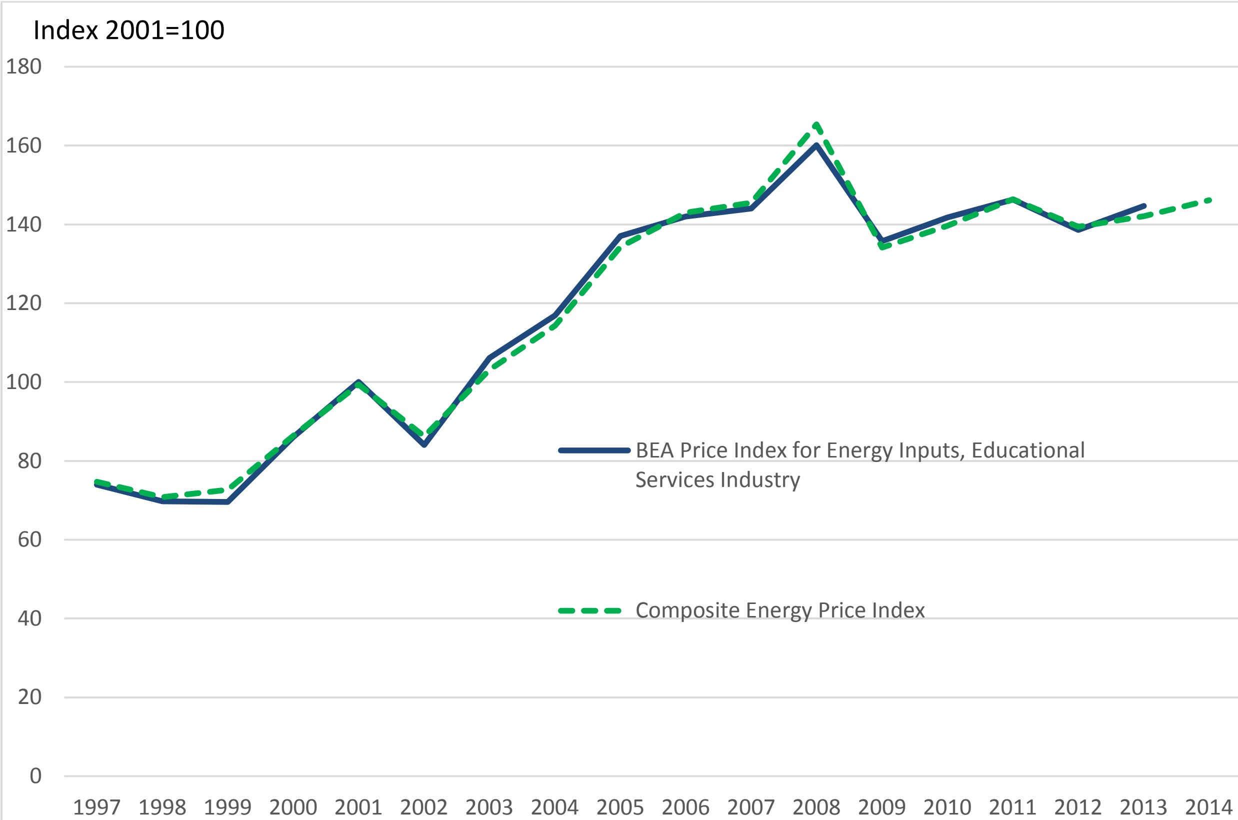
In previous reports (Taylor 2010, 2011 and 2013) I recommended using a weighted average of the PPIs for commercial electricity and commercial natural gas as a composite energy price index. Historically, that composite performed very well as a proxy for the BEA's Chain-Type Price Index for Energy Inputs for the educational services industry. However, the predictive power of that composite has deteriorated recently. Therefore, I recommend switching to an energy index that is a weighted average of the PPIs for commercial electricity, commercial natural gas and gasoline.[6] As Figure 2 illustrates, including gasoline prices in the calculations yields an energy price index that is very highly correlated with the BEA's price index for energy inputs for the educational services industry.[7]

[5] The BEA's Chain-Type Price Index for Materials Inputs for the educational services industry is available from 1997 through 2013. Over that time period, the Pearson correlation between the BEA's index and the PPI for office supplies and accessories is 0.9854.

[6] The composite index is a weighted average of the PPIs for commercial electric power, commercial natural gas, and gasoline, where the indices are rebased so that 2001=100 before they are averaged together, and the regression-based weights are 0.2812, 0.5941 and 0.1183, respectively.

[7] The BEA index for educational sector energy is available from 1997 through 2013. Over that time period, the Pearson correlation between the BEA index and the composite energy index is 0.9973.

Figure 2: The Relationship between the BEA's Energy Input Price Index for the Educational Services Industry and the Composite Energy Cost Index



Sources: U.S. Bureau of Labor Statistics, US Bureau of Economic Analysis and author's calculations.

Recommendations

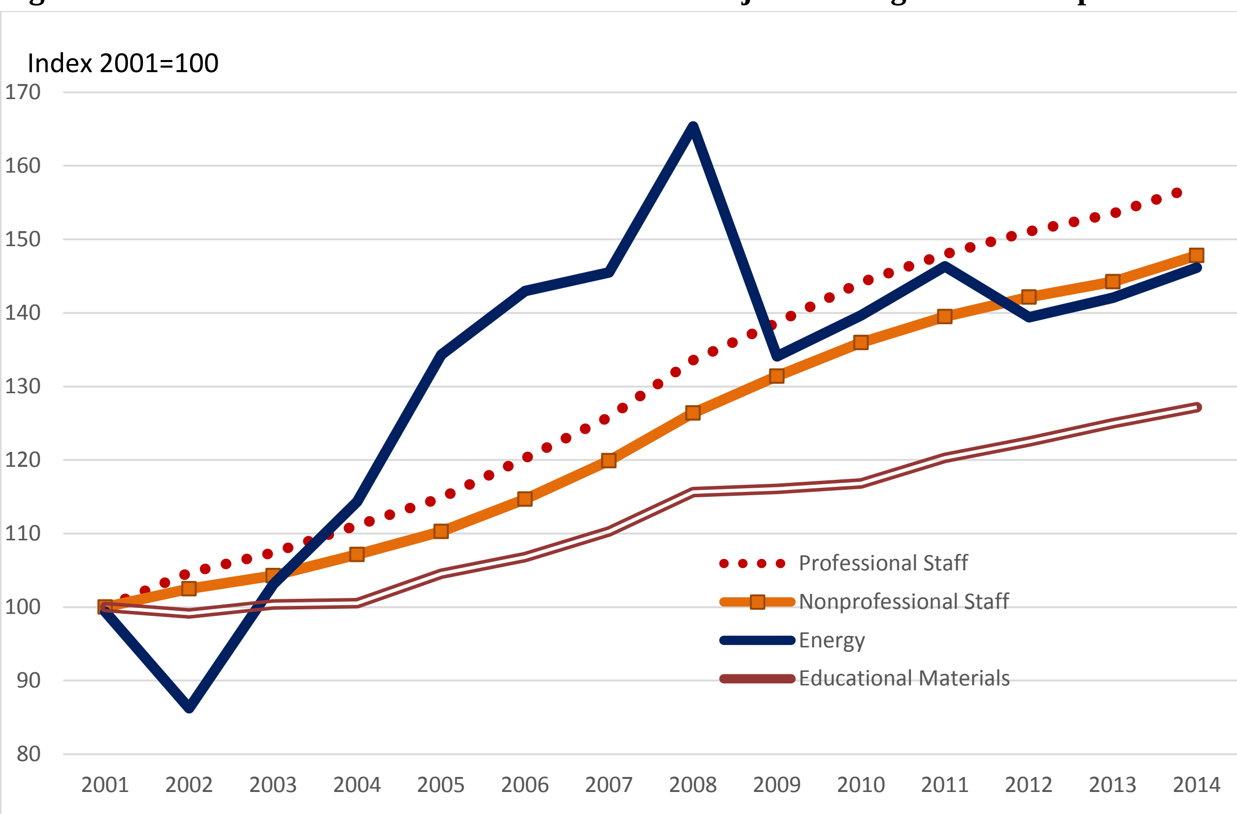
Table 2 summarizes the recommended price indices for each of the four funding model cost components while Figure 3 illustrates the relationship among those indices. As the table and figure illustrate, the CWI and HS-CWI have been rising steadily, with somewhat more growth in professional wages than in nonprofessional wages. The educational materials cost index has grown more slowly than either labor cost index. The energy cost index has been the most volatile of the four, which is consistent with recent swings in the price of natural gas and gasoline.

Table 2: The Recommended Cost Indices for Funding Model Components

Year	Professional Staff Cost Index	Nonprofessional Staff Cost Index	Energy Cost Index	Educational Materials Cost Index
2005-06	115	110	134	105
2006-07	120	115	143	107
2007-08	126	120	146	110
2008-09	134	126	165	116
2009-10	139	131	134	116
2010-11	144	136	140	117
2011-12	148	139	146	120
2012-13	151	142	139	122
2013-14	154	144	142	125
2014-15	157	148	146	127

Note: The Professional Staff Cost Index is the updated Wyoming CWI, while the Nonprofessional Staff Index is the Wyoming High School CWI. See Taylor (2011) for details on the construction of these indices. The Energy Cost Index is a weighted average of the annual average PPIs for commercial electricity, commercial natural gas and gasoline, where the weights are 0.281, 0.594 and 0.118, respectively. The Educational Materials Cost Index is the annual average PPI for office supplies. All indices have been rebased so that 2001=100.
Sources: U.S. Bureau of Labor Statistics, National Center for Education Statistics and author's calculations.

Figure 3: Recommended Cost Indices for the Four Major Funding-Model Components



Sources: U.S. Bureau of Labor Statistics, National Center for Education Statistics and author's calculations.

Conclusions

Since 2012, the Wyoming legislature has used separate indices to monitor inflation pressures and determine appropriate ECAs for each major component of the funding model—professional staff, nonprofessional staff, energy and educational materials. Those ECAs have been applied annually to the evidence-based funding model to ensure that school districts continued to have access to the real resources identified as necessary by the state's consultants. ECAs have not been applied annually to the Legislature's funding model, which is more generous than the evidence-based funding model due to legislative discretion. The 2014 Monitoring Report shows that the Legislature's funding model—even without the application of an annual ECA—has thus far provided more revenues to school districts than the evidence-based model would require. (Picus and Odden 2015).

When properly calibrated using an appropriate price index (such as those recommended here) ECAs do nothing more than maintain the status quo. Therefore, their appropriate role in the Wyoming funding model depends on the nature of the resource prices used to construct the evidence-based funding model. If the baseline price estimates are accurate, then applying an annual ECA is necessary to ensure that inflation does not affect the ability of school districts to purchase the recommended level of real resources. If the baseline price estimates overstate actual costs for one or more of the funding components, then applying an ECA to those funding components would simply perpetuate that overfunding, and the most appropriate policy response could be to forgo applying an ECA to those funding components until costs and funding converge. Similarly if a baseline price estimate understates actual costs for a funding component, then applying an ECA to that baseline estimate could keep the problem from getting worse, but would not eliminate the underfunding problem. Monitoring the situation annually for evidence that model prices overstate or understate actual costs seems prudent.

Bibliography

Goldhaber, D.D. (1999). An Alternative Measure of Inflation in Teacher Salaries. In W.J. Fowler, Jr. (Ed.), Selected Papers in School Finance, 1997–99 (NCES 1999-334) (pp. 29–54). U.S. Department of Education. Wyoming, DC: National Center for Education Statistics.

Picus, L.A. and A. Odden. Desk Audit of the Wyoming School Funding Model. A report to the Wyoming Legislature. Retrieved September 25, 2015 from http://legisweb.state.wy.us/LSOWeb/SchoolFinance/2015WYFundingModelDeskAudit.pdf.

Taylor, L.L. 2013. External Cost Adjustments for the Wyoming School Funding Model: 2013 Addendum. A report to the Joint Appropriations Committee and the Joint Education Committee.

Taylor, L.L. 2011. External Cost Adjustments for the Wyoming School Funding Model. A report to the Joint Appropriations Committee and the Joint Education Committee. Retrieved September 27, 2015 from http://legisweb.state.wy.us/2011/Interim%20Studies/Taylor_ExternalCostAdjustments2011Final.pdf.

Taylor, L.L. 2010. An Analysis of Wyoming Cost Adjustments. A report to the Select Committee on School Finance Recalibration.

Taylor, L.L. 2008. Comparing Teacher Salaries: Insights from the U.S. Census. *Economics of Education Review*, 27(1): 48-57.

Taylor, L.L. 2006. Comparable Wages, Inflation and School Finance Equity. *Education Finance and Policy*. 1(3): 349-71.

Taylor, L.L., and W.J. Fowler, Jr. 2006. A Comparable Wage Approach to Geographic Cost Adjustment NCES 2006–321. Wyoming, D.C.: National Center for Education Statistics.

SELECT COMMITTEE ON SCHOOL FINANCE RECALIBRATION

APPENDIX G

ESTIMATED COST DIFFERENCES BETWEEN EVIDENCE-BASED MODEL AND STATUTORY MODEL SCHOOL YEAR 2015-2016

Model Category	Evidence-Based Model FTEs	Evidence-Based Model Costs	Statutory Model FTEs	Statutory Model Costs	Estimated Differences FTEs	Estimated Differences Costs
Personnel						
Central Office Administrative Staff	267.9	$36,176,760	283.6	$40,307,564	15.7	$4,130,804
Central Office Classified Staff	415.2	$24,445,073	322.8	$19,697,141	(92.4)	($4,747,932)
O&M Staff: Custodians	735.9	$38,137,440	753.7	$40,385,173	17.8	$2,247,732
O&M Staff: Maintenance Workers	328.4	$19,365,658	331.8	$20,288,105	3.3	$922,448
O&M Staff: Groundskeepers	448.2	$26,463,498	448.2	$27,497,085	0.0	$1,033,587
Elementary School Teachers	3,359.5	$260,636,203	3,621.6	$291,344,446	262.1	$30,708,243
Core	*2,799.6*	*$217,196,836*	*3,018.0*	*$242,787,039*	*218.4*	*$25,590,202*
Elective	*559.9*	*$43,439,367*	*603.6*	*$48,557,408*	*43.7*	*$5,118,040*
Middle School Teachers	906.0	$70,003,763	1,181.1	$94,877,115	275.2	$24,873,352
Core	*755.0*	*$58,336,469*	*888.1*	*$71,336,177*	*133.1*	*$12,999,708*
Elective	*151.0*	*$11,667,294*	*293.1*	*$23,540,938*	*142.1*	*$11,873,645*
High School Teachers	1,342.7	$103,607,167	1,524.4	$122,477,152	181.7	$18,869,985
Core	*1,007.0*	*$77,705,375*	*1,146.2*	*$92,088,084*	*139.2*	*$14,382,709*
Elective	*335.7*	*$25,901,792*	*378.2*	*$30,389,068*	*42.6*	*$4,487,276*
Additional CTE Teachers	0.0	$0	37.6	$3,011,489	37.6	$3,011,489
Minimum Teacher FTEs	334.3	$25,287,046	205.1	$16,044,541	(129.2)	($9,242,506)
Small School Teachers	5.0	$385,169	168.8	$13,561,723	163.8	$13,176,554
Alternative School Teachers	0.0	$0	135.4	$11,034,141	135.4	$11,034,141
Small District Additional Teachers	0.0	$0	16.0	$1,245,204	16.0	$1,245,204
Tutors	610.6	$47,222,768	385.6	$30,994,357	(225.0)	($16,228,410)
ELL Teachers	37.5	$2,948,117	37.1	$3,038,399	(0.4)	$90,282
Substitute Teachers	376.9	$7,293,159	365.6	$7,092,424	(11.3)	($200,735)
Guidance Counselors	346.5	$26,822,869	170.9	$13,727,638	(175.6)	($13,095,231)
School Nurses	124.1	$9,610,703	0.0	$0	(124.1)	($9,610,703)
Pupil Support	300.9	$23,244,899	385.6	$30,994,357	84.7	$7,749,459
Librarians	243.8	$18,751,834	286.9	$22,975,325	43.1	$4,223,491
Library Aides	73.0	$2,829,231	0.0	$0	(73.0)	($2,829,231)
Computer Technicians	149.3	$10,686,228	135.6	$10,037,912	(13.7)	($648,316)
Supervisory Aides	577.3	$22,235,901	645.8	$25,590,832	68.5	$3,354,931
Principals	254.0	$29,716,141	268.6	$32,631,100	14.6	$2,914,959
Assistant Principals	85.9	$9,050,465	85.9	$9,376,514	0.0	$326,049
Alternative School Assistant Principals	0.0	$0	18.0	$1,889,057	18.0	$1,889,057
Small School Assistant Principals	99.0	$9,627,541	59.0	$6,082,128	(40.0)	($3,545,414)

Model Category	Evidence-Based Model FTEs	Evidence-Based Model Costs	Statutory Model FTEs	Statutory Model Costs	Estimated Differences FTEs	Estimated Differences Costs
Secretarial Staff	346.7	$19,379,851	327.4	$18,938,764	(19.3)	($441,087)
Clerical Staff	309.7	$14,430,112	383.3	$18,416,444	73.6	$3,986,333
Instructional Facilitators	492.8	$36,613,404	286.1	$22,174,820	(206.7)	($14,438,584)
Extended Day Teachers	331.4	$24,560,925	72.8	$5,847,813	(258.6)	($18,713,112)
Summer School Teachers	331.4	$24,560,925	110.8	$8,896,315	(220.6)	($15,664,609)
Subtotal Personnel	*13,233.7*	*$944,092,852*	*13,055.1*	*$970,475,079*	*(178.7)*	*$26,382,227*
Non-Personnel						
Gifted and Talented		$3,724,091		$2,818,261		($905,831)
Intensive Professional Development		$11,637,786		$11,273,042		($364,744)
Short Cycle Formative Assessment		$2,327,557		$3,509,556		$1,181,999
Instructional Materials		$17,689,435		$34,146,112		$16,456,677
Technology & Equipment		$23,275,572		$28,182,606		$4,907,034
CTE Equipment/Materials		$2,870,410		$2,870,410		$0
Extra Duty/Student Activities		$29,299,027		$32,061,237		$2,762,210
Central Office		$33,819,127		$33,819,127		$0
Utilities		$35,741,920		$35,741,920		$0
O&M Supplies and Materials		$13,043,080		$13,043,080		$0
Subtotal Non-Personnel		*$173,428,005*		*$197,465,350*		*$24,037,346*
Grand Total	**13,233.7**	**$1,117,520,857**	**13,055.1**	**$1,167,940,430**	**(178.7)**	**$50,419,573**