

**AN EVIDENCED-BASED APPROACH TO  
SCHOOL FINANCE ADEQUACY IN ARIZONA**

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**The following report was developed in cooperation with a 26 member Steering Committee representing leaders of Arizona’s business community, education community, the Arizona Community Foundation, the State Department of Education and the Governor’s Office.**

# **AN EVIDENCED-BASED APPROACH TO SCHOOL FINANCE ADEQUACY IN ARIZONA**

**"The foundation of every state is the education of its youth." -Diogenes**

**"Our progress as a nation can be no swifter than our progress in education. The human mind is our fundamental resource." - John Fitzgerald Kennedy**

**"Foresight is everything now." –Five Shoes Waiting to Drop**

## **Introduction and Overview**

Arizonans stand at a crossroads. For decades, Arizona's great natural beauty, rich cultural heritage and promise of economic opportunity have attracted hundreds of thousands of immigrants to the state. Growth has been the engine driving Arizona's economy. Accordingly, significant public policy has been designed to entice businesses and families to relocate to Arizona.

In the decades to follow, Arizona will need to look beyond its current policies to ensure a good quality of life for the millions of people who call Arizona home. To continue on the current path without heeding the warning signs of trouble ahead will prove disastrous to the social and economic health of the state.

Education continues to be at the top of every policy agenda at every level of government and will likely remain there as long as Arizona continues to rank at or near the bottom of nearly all major educational rankings. Though much political rhetoric exists concerning the troubles plaguing Arizona public education, significant change occurs infrequently, and significant improvement is almost impossible under current policies.

Arizonans must decide which road to take: the current path that warns of impending disaster for our education system and our state, or an alternate path—one that seeks to identify what it takes to significantly improve Arizona’s education system and has the support of Arizona’s citizens.<sup>1</sup>

### **What It Takes**

Improving the state’s education system will require both good strategy and adequate resources—of which only the former gets thoughtful attention in current policy circles. Indeed, there are two public policy conversations taking place in education today. In one conversation, the strategy is to push improvement in the education system through standards-based reform and accountability for academic results. In the second conversation—the one concerning resources—the strategy, if one can call it that, is to allot to education whatever resources and funding are available, often *after* the government funds competing interests. The latter strategy makes the former shallow; the latter should be based on the former, equally ambitious and forward looking. It is imperative that the two strategies meet, if we are to significantly improve the quality of the education system and the way that it is funded.

Standards-based reform and accountability. The recognition by policymakers and others of the need to train students to higher levels of proficiency has been the underlying force of the standards movement in education. In Arizona, the Arizona Academic Standards came about in 1996 as the business, education and policy communities recognized that students must have a certain set of high-level skills in order to be successful in the worlds of work or higher education. This set of skills was deemed so

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<sup>1</sup> Our report covers all public schools – those managed by school districts as well as the state’s large number of publicly funded Charter schools.

important that, beginning in 2006, no Arizona high school student will receive a high school diploma without demonstrating proficiency in these agreed-upon skills.

Furthermore, the push for high academic standards continues as both the state and federal governments have recently enacted legislation holding schools to a level of accountability never seen before. The federal No Child Left Behind Act of 2001 (NCLB) and Arizona's Proposition 301, approved by voters in 2000, hold schools accountable for the performance of students to proficiency levels on the state's academic standards. Further, NCLB requires that *every group of students* perform to the same high academic standards; achievement gaps between subgroups of students will no longer be tolerated.

Policymakers and the public have made very clear to the education community that academic results are of the highest importance and schools failing to meet those expectations can expect serious sanctions. But these higher expectations, combined with a more challenging population of students and low levels of education funding, make the school's job to increase performance exceedingly difficult. Without adequate support from either the state or federal governments, schools are being set up to fail.

School funding. While policymakers have increased their expectations of public schools and are attaching consequences for failure, funding decisions continue to be made without regard to those same expectations. Yes, Proposition 301, passed by voters in 2000, was an important step forward in providing a much needed resource boost to education. But, Arizona still provides less to schools than 49 other states (Quality Counts, 2004). Further, Arizona continues to fund schools on the basis of available resources and often after competing interests get their share of those resources. Whatever is allocated to education is assumed to be enough to accomplish the numerous

requirements and high expectations placed on schools. There has been little talk about whether such an approach to school funding provides education resources that are *adequate* to properly teach students to the state's higher standards. Put differently, while the state created an appropriate, yet ambitious set of goals for the education system—literally requiring a tripling of student performance results over the medium term—it has made only modest changes in the resource base with Proposition 301, and it has made no change in the structural approach to school funding. Although full funding of the federal No Child Left Behind Act would help, it would not solve the problem. School funding is a state responsibility and Arizona needs a better and more adequate approach to ensure support necessary to educate its students. We address that need in this report.

### **The Right Thing to Do For Our Children and a Healthy Economy**

There are many reasons why improved education is a key to the future health and well being of Arizona and its diverse citizens. Maintaining and enhancing economic vitality is one critical reason. Enhancing the knowledge, skills and wellbeing of its citizens is an equal second.

A major quality of life indicator for a state is the condition of its public education system. Yet, Arizona consistently ranks at or near the bottom of educational rankings. These rankings show Arizona to be below national averages in student achievement, teacher pay, and per-pupil spending; the data show that Arizona ranks 49<sup>th</sup> of the 50 states in per pupil spending for current operating purposes, even when including Proposition 301 monies (National Education Association, 2003; Quality Counts, 2004) and educates under one-fourth of its students to a national proficiency standard in reading and mathematics in grades 4 and 8 (Manzo & Galley, 2003).

Arizona's current education system not only cheats our own children from future educational and economic opportunities, but it is also a significant detractor to talented prospective workers considering locating in Arizona (Morrison, 2001).

Arizona's economic vitality grows more and more dependent on highly skilled workers who can "think" rather than "make," shifting the emphasis from manufacturing to a knowledge economy. Successful workers—college-educated or not—will need to be proficient problem-solvers and analytical thinkers. Thus, the quality of the state's public K-12 education system will determine the quality of the state's future work force and the quality of life for all Arizonans.

The demographic challenge for education and the economy. Arizona faces a unique set of demographic challenges when it comes to education. Arizona is a rapidly growing state. Arizona's population increased by 40 percent from 1990 to 2000, growing to just over 5 million people (U.S. Census Bureau, 2000). This kind of growth puts a strain on all government services, including education, where it has evidenced itself primarily in the construction of new schools.

Arizona's population is not just growing but also rising in complexity, particularly in terms of language diversity and poverty. Latinos are the fastest growing demographic group, comprising 25 percent of the population in Arizona today, an increase of over half a million people since 1990. As a group, the Latino population in Arizona grew by 86 percent over the past decade.

Furthermore, Latino students comprise over one-third of all K-12 students (Arizona Department of Education, 2002). With the increased number of Latino students, language challenges become major issues in the public schools. A large number of Latino

students enter Arizona schools as English language learners and struggle to keep up with their English fluent classmates. Not any less capable, English language learners require additional time and resources to meet the same academic standards as their peers.

Another demographic factor affecting Arizona's children's education is poverty. Increasing percentages of children – not just Latino children – come from low-income households where educational materials and rich educational experiences are not readily available. Statewide, 50 percent of all students qualify for the free and reduced price lunch program available through the federal government, meaning that these children come from families with incomes at or below 150 percent of the poverty level (Arizona Department of Education, 2003). Children growing up in poverty, regardless of ethnicity, are more likely to struggle to meet academic standards than their more privileged peers.

Unfortunately, growing numbers of these and other students are not today receiving an education that prepares them for the Arizona workforce of tomorrow. A revitalized education system that educates all students to our established Arizona Academic Standards is needed to turn these current demographic and educational phenomena into assets for the state's economy.

Our civic responsibility. Improving the education system for all students is also, quite simply, the right thing to do. Education equals opportunity. To deny children – whatever their income or ethnic background – access to a quality education system is to deny them choices and opportunities throughout their lives. Children who do not have access to a quality education system will be hampered greatly in their ability to make significant contributions to their families, communities, and the economy.

While there are large numbers of students who attend schools where they are challenged and taught to the Arizona Academic Standards, these academic experiences are not yet available to all Arizona students. To provide all children quality educational experiences is pivotal – it creates opportunity for them as well as the state as a whole. Everyone wins: individuals have more and better life options, and the state’s economic vitality can grow stronger and deeper.

### **Does Money Matter?**

An all too common viewpoint of education critics is that “money doesn’t matter.” Opponents of any increased funding to education will cite studies that show spending per pupil does not correlate to student achievement. The problem is that other analysts reference the same studies and show that spending does matter. While the analysts debate, funding stays the same, and student performance does not grow sufficiently.

However, nearly all can agree that *the way* money is used does matter. Those who seem to oppose funding increases claim that more money will not matter if it is not used differently. And too often, those who support funding increases seem to imply that more is needed to fund old strategies. What is needed is a clear strategy for spending all money more effectively – both the money currently in the system and any new money that might be allocated to the system.

What also is needed is to determine whether all evidence-based practices – educational strategies that have evidence to show they do produce student learning gains – can be funded by the resources currently in the system, and if not, how much more money is needed to allow schools and districts to deploy these proven-effective

strategies. Arizona's education goals will only be accomplished by deploying all known effective strategies in all schools.

More money will also be needed to educate certain groups of students to the Arizona Academic Standards. Nationally and in Arizona, large discrepancies exist in the performance of different groups of students before they enter any school. On most standardized tests, a school located in a wealthy suburb, where the vast majority of students enter school with academically-rich prior school experiences, will significantly outperform a school in a low-income neighborhood, where children begin school with an educational disadvantage. If both schools receive the same per-pupil funding, critics take the results to mean that funding doesn't matter.

The reality is that it is more difficult – and requires a variety of specific strategies – to teach some groups of students to academic standards than others. Not any less capable, students from low-income backgrounds usually have less access to quality preschool experiences, are more likely to be English language learners and are more likely to be mobile. Money does matter for these students, and an adequate amount of money is critical for these students to meet the same high standards as their more privileged peers.

In sum, money does matter. An adequate level of money is required so that all students can experience evidence-based practices that help them learn to higher standards. A professional use of money is required so that each and every dollar in the system is used in the most effective way. Money spent on ineffective approaches will yield little to no discernable results. Appropriate differentiation of resources, based on individual student needs, will be required so that all students receive the level of

education resources needed for them to perform to high standards; funding per pupil will need to vary so that all students can learn to high proficiency standards.

### **Why Arizona Needs a School Funding Adequacy Study?**

As indicated above, Arizona has devoted considerable attention to designing its education reform strategies and goals, but has paid insufficient attention to the resource side of this agenda. A school finance adequacy study, funded by the Rodel Charitable Foundation of Arizona with support from Greater Phoenix Leadership, addresses this important need.

Addressing the funding side of the education reform agenda is critical because the performance goals are so ambitious. The May 24, 2004 Arizona Department of Education web site showed that the percentage of students scoring at or above mastery in mathematics was only 66 % in grade 3, 49 % in grade 5, 21 % in grade 8 and 36 % in grade 10. The reading numbers were only a tad better: 77 % in grade 3, 47 % in grade 5, 55 % in grade 8, and 59 % in grade 10. But on the somewhat harder National Assessment of Educational Progress (NAEP) tests, data show that only 23 percent of Arizona's 4<sup>th</sup> graders are reading at grade level—significantly less than the national average of 30 percent, placing us 44<sup>th</sup> out of 50 states (Manzo & Galley, 2003). This bleak picture does not improve much by the 8<sup>th</sup> grade, where only 25 percent of Arizona students are reading at grade level compared to the national average of 30 percent. The national results are about the same for mathematics performance.<sup>2</sup>

Although these results are marginally better than a few years ago, Arizona cannot be satisfied with improving performance only marginally; such modest gains will not

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<sup>2</sup> Given the dismal national average figures on the NAEP assessments, it should be clear that performing at the national average, like the 50<sup>th</sup> percentile, as might be indicated by some commercially distributed norm-referenced tests, does not illustrate acceptable educational attainment.

allow the economic vitality needed for the state to continue to prosper or for all individuals to enjoy a good life. Arizona's education system – like those in virtually all states – needs to double and triple current performance so that in the short term, 50 percent of students achieve proficiency, and in the medium term 75 percent of students achieve at that level. This task is daunting and will require a dramatically different approach to teaching and learning within schools as well as to Arizona's public school funding.

This adequacy study provides a blueprint for how to do both. Schools must redesign the way they operate in order to take advantage of the evidence on educational effectiveness presented in this paper and all new and current dollars will need to be reallocated towards these evidence-based approaches if these ambitious education goals are to be accomplished. As the report shows, this approach will require an infusion of new moneys.

Costs included in the study. We noted at the beginning that the educational costs included in this study address only instructional needs. The study does not address operational costs such as construction, transportation, food services, and other statutory requirements. Although these latter costs are important – and also require resources – we believe that the core of an adequacy study should focus on the instructional program because it is a better instructional program that will produce large gains in student learning. At some point, non-instructional areas should be addressed. Efficiencies probably can be squeezed out of some of them, and others may require additional dollars – as evidenced by the significant role the state plays in school construction. But this study focuses on the 75 percent of the education dollar that includes all instruction, pupil

and instructional support, and school administration. These are the functions that encompass the instructional program; these are the critical functions that first need to be redesigned and adequately funded in order for student performance to rise to the levels identified in Arizona's education reforms.

This report is focused on answering the following key questions:

1. What does it take educationally to educate all, or nearly all, students to or above proficiency on state standards and to improve the performance of students at all quartiles, as measured by the state's AIMS tests?
2. How much do those strategies cost, and what is the size of the gap, if any, between current resource levels and adequate levels needed to implement all evidence-based strategies?
3. What is the program and fiscal implementation strategy? First, how can current dollars be used more effectively both through finding inefficiencies and reallocating current resources? Second, how can any new dollars be targeted only to Evidence-Based practices that produce more results in student achievement?

## **2. Applying the Evidence-Based Approach in Arizona**

To answer these questions, this report presents a school finance adequacy study. Since 1990, the school finance community has developed a number of alternative methods for determining school finance adequacy. These are summarized in Odden (2003), an article that identifies strengths and weaknesses of each approach. We believe that the most substantively sound methodology is the Evidence-Based approach.

The Evidence-Based approach identifies a set of school-level ingredients that are required to deliver a comprehensive and high-quality instructional program within a

school and the evidence on their effectiveness, and then determines an adequate expenditure level by placing a price (e.g. an appropriate salary level) on each ingredient and aggregating the ingredients to a total cost. This approach is more explicitly based on evidence from 3 sources: research with randomized assignment to the treatment (the so-called “gold standard” of evidence), research with other types of controls or statistical procedures that can help separate the impact of a treatment, and best practices either as codified in a comprehensive school design (e.g., Stringfield, Ross & Smith, 1996) or from studies of impact at the local district or school level. The Evidence-Based approach to determining school finance adequacy defers to evidence on the level of resources needed to meet pre-determined performance goals much more strongly than the professional judgment of educators.

This section of the report takes this approach, with which the consultants – Allan Odden and Lawrence O. Picus – retained by the Rodel Charitable Foundation of Arizona have been associated (Odden, Picus & Fermanich, 2003; Odden, Fermanich & Picus, 2003; Odden, 2000). It describes how this approach would be used to identify the core educational resource needs of prototypical elementary, middle and high schools in Arizona – resources that would be adequate for schools to educate their students to state performance standards. Section 3 summarizes the changes recommended by the Professional Judgment Panels that met on February 4 and 5, 2003 in Phoenix and reports the response of the Steering Committee to them. An Appendix A summarizes proposals from professional judgment panels in a few other selected states. Section 4 takes key findings from Sections 1, 2 and 3 and presents a full set of recommendations for

resources for prototypical elementary, middle and high schools. Section 5 summarizes the cost estimates for these recommendations.

Before proceeding, we should note that the Steering Committee has adopted a definition of what an adequate education is, and that definition served as a basis for identifying the resources required for adequate funding. The Committee's definition of educational adequacy is:

- a. The expectations included in Arizona's Academic Standards, which define what all Arizona's students are to be taught.
- b. The standards included in the state's testing system, which include a definition of what would be considered a proficient score for each test. The goal is to have all, or all but the most severely disabled, students perform at or above proficiency on these tests.
- c. The standards included in the state's accountability system, Arizona LEARNS, which further requires improvement for students at all levels in the achievement range, including the top scoring students.
- d. Sufficient funding to provide the resources identified in the resource matrix contained in Table 1 of this report.

Full implementation of this definition of an adequate education program with the proposed resources will require that each school rethink, if not restructure, its entire educational program and reallocate all current and any new resources to this restructured and more effective educational program. Such a system will need to be accompanied by a clear accountability and monitoring program.

## **New Vision of a School**

Before identifying the following school resources, we would like to sketch our vision of a much more effective school. The vision includes large changes from most schools as we know them, because the performance improvement goals require quantum improvements. As stated in the introduction, the education performance improvement challenge facing Arizona is to double and then triple student academic achievement over the next several years. This task cannot be accomplished by working harder in schools as we know them; educators will need to work smarter in redesigned schools. Schools will need to be restructured. All current dollars – and any new dollars required to adequately fund each school – will need to be reallocated to this new, more powerful vision of a school. The vast bulk of those resources would be used for more direct services to students, for instructional purposes and for the consistent and ongoing improvement of classroom instruction. The assumption, backed by a wide variety of research, is that better classroom instruction is the prime route to improved student performance. Funds need to focus on student needs and surround classrooms with supports that help all teachers dramatically improve their classroom instructional practices. To ensure that young students have minimum academic and social skills so they are ready to learn when they enter school, the new school vision includes preschool and full-day kindergarten, if not for all students, then at least for children entering school from low income backgrounds.

Our new school vision has small classrooms in the early elementary years, when learning to read and the basics of numeracy– the foundations for learning everything else – are critically important. The new school vision has class sizes of 25 for grades 4-12.

The new school vision then has a comprehensive, integrated and rigorous professional development structure and strategy to help all teachers enhance their instructional practice in quantum leaps. The new school vision also includes intensive extra help strategies so that no student falls behind and any student struggling to learn to standards is provided immediate, intensive help to do so. The new school vision assumes all students will take a common core of rigorous classes, with the goal of taking algebra by the eighth grade, and the college preparatory curriculum in high school. The new school vision includes substantial family outreach and involvement resources. The vision includes funds so that the school can stay up-to-date with computer technology resources and tap the Worldwide Web for instructional materials and even instructional courses – when and if they become available.

It should be clear that this new vision, each element backed by evidence on its effectiveness, is very different from typical schools in Arizona today. Our proposals take all current school level and instructional resources and reallocates them, plus an additional \$1.3 billion of new resources and an extra \$0.45 billion for higher teacher salaries, to a proposed set of evidence-based, proven-effective strategies. Some but not many three- and four-year olds experience preschool; we support a full preschool program for all three- and four-year olds (whose parents want them), particularly those from lower income families. Full-day kindergarten is not supported by the current school aid program; we support, as the state has now pledged to fund, full day kindergarten for all students, beginning with those from lower income families. The typical K-3 classroom today has 24 students; we propose 15, based on results from randomized experiments. Classes in grades 4-12 often have 30-35 students; we propose 25 based on

best practices. Many teachers leave Arizona's schools because of low salaries and little instructional support; we propose both raising salaries and providing intensive instructional support. Typical professional is usually a mile wide and an inch deep, with little if any follow through coaching; we propose intensive and ongoing professional development, with two-week summer institutes and coaching in all classrooms to get real instructional change. Our proposed professional development resources can also be deployed for a strong new teacher induction and mentoring program, so learning how to teach will be structured rather than random. The typical intervention for students not learning to proficiency is a pull out remedial program, with aides often providing the help; we propose the most effective strategy – one-to-one tutoring by certified teachers and no instructional aides. In most schools, guidance counselors, social workers and other pupil support personnel work in isolation with little impact; we propose integrated family outreach-pupil support teams stressing those actions parents can take to help their children learn. For the maximum impact, our resources need to be used to deploy a more effective curriculum program, from too much whole language reading today to a balanced approach with more phonics, from just basic skills in mathematics today to mathematic concepts with applications to real-world problems, from little science today to science concepts again with applications to real-world issues, and to a stronger approach to U.S history. Our model includes ample resources for art, music, physical education and advanced work for the gifted, talented and able and ambitious student.

We should note that our new school vision does not propose additional funding for longer school years or longer days for students. It does not include small classes of 20 for students in grades 4-12, as many professional judgment adequacy studies do. The

new school vision proposes no assistant principals, no deans, and no instructional aides. Because the model excludes many high cost proposals and practices seen elsewhere, and our new vision is to have smaller school units, these “support” and non-instructionally oriented resources are not needed.

Over time, we seek to have a larger number of small, personalized, school units – no larger than 500 students – at all levels in the education system. This recommendation is justified by a wide range of research showing that smaller schools work better for all children, especially at the secondary level, and especially for lower income, minority and English language learning students.

Our new school vision is quite different from many schools in Arizona today. The vision may not be as technologically radical as some would want, but we do not yet have evidence for a school vision laden with technology that would be better. We believe our vision could “morph” into such an even stronger vision once that is possible, and we have provided the technology resources to position schools to do so.

Evidence underlying this vision and these ambitious student performance expectations. To those who wonder whether there is a knowledge base for improving student achievement so dramatically, we would direct their inquiry to research – largely from cognitive psychology – during the past two decades. This research has shown us that all students can learn complex materials, and learn to think, understand, problem solve and communicate in written and oral form effectively. This research was nicely summarized in a recent book from the National Academy of Sciences (Bransford, Brown & Cocking, 1999), which includes chapters not only on student learning, but also on how that knowledge can be translated into curriculum standards for students and professional

development for teachers. One finding from that research is that students cannot learn to understanding and problem solving levels, unless the curriculum, instructional and testing processes are redesigned to make those demands of all students. Thus, research shows not only that the vast bulk of students from lower income, minority or English language learning backgrounds can learn complex materials, but also that these students often are the prime beneficiaries of new instructional programs that expect them to learn to those levels, and provide the extra assistance some might need to perform to those levels. Put a different way, although there is a low achievement/high poverty link today, it does not have to be that way, or at least the linkage can be much less than it is. In sum, we believe that the country, Arizona and the professional education communities have the professional knowledge base to produce the quantum improvements in student learning, including improvements for lower income and English language learning students, that would be allowed by the adequate funding models we are proposing.

Finally, to those who would quote the education production function studies as concluding that money does not make a difference, we quote from the recently published 3<sup>rd</sup> edition of the school finance text of our consultants:

The most often cited research in this field [economic production functions] is the synthesis work of Eric Hanushek (1981, 1986, 1989, 1997). Hanushek has consistently argued that there does not appear to be a systematic relationship between the level of funding and student outcomes (see also Hanushek, 2002, on the class size debate).

Hanushek has now analyzed 90 different studies, with 377 separate production function equations over a 20-year time period. In his 1997 publication, he continued to argue that "These results have a simple interpretation: There is no strong or consistent relationship between school resources and student performance. In other words, there is little reason to be confident that simply adding more resources to schools as currently constituted will yield performance gains among students" (Hanushek, 1997: 148).

Hanushek essentially divided the 377 different findings into two major categories: those indicating a positive and those indicating a negative relationship. He compared the numbers in each category and found more negative than positive findings. He then concluded that the variation in findings was such that a systematic relationship between money and outcomes had not yet been identified...

Others have analyzed the same studies as Hanushek and reached opposite conclusions. Hedges, Laine and Greenwald (1994a, 1994b; see also Laine, Greenwald & Hedges, 1996; and Greenwald, Hedges & Laine, 1996a, 1996b) concluded that in fact, money can make a difference. They calculated the effect size of the different studies and, rather than counting the number of positive and negative findings, calculated an average effect size; their results produce a significantly positive effect size. The larger effects of the "positive" studies are greater than the smaller effects of the "negative" studies. Relying on this and other evidence, Hedges Laine, and Greenwald, (1994a) concluded that school spending and achievement are positively related. In his rejoinder, Hanushek (1994) argued that while there is evidence that the relationship exists, there is not evidence of a strong or systematic relationship. We side more with Hedges, Laine and Greenwald than with Hanushek, viewing the "effect size" as the way to summarize across studies.

We would, however, note that beyond this more arcane debate about the conclusions of economic production function studies, all analysts conclude that *it is the way money is spent that will make the largest and critical differences*. That is why the most recent National Research Council's book on school finance is entitled *Making Money Matter* (Ladd & Hansen, 1999). And, that is why our report's recommendations, if funded and implemented, would redirect school resources to those strategies for which there is evidence that they do work. As will be clear, each and every one of the Committee's proposals is backed by evidence on its effectiveness. If current and new funds in schools were used to implement the Committee's recommendations, greater student performance should result – AIMS scores should rise – once again showing that it is the way money is used in schools that makes the impact on student performance real and measurable. The following details our recommendations.

## **Pre-School**

Research shows 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, 1995, 1996, 2000; Karoly et al., 1998; Slavin, Karweit & Wasik, 1994). Indeed, these longitudinal studies show that students from lower income backgrounds who experience a high quality, full-day pre-school 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. The research shows that there is a return over time of *eight to ten dollars* for every one dollar invested in high quality preschool programs.

Further, a late 2003 published study of state-financed pre-school programs in six states – California, Georgia, Illinois, Kentucky, New York and Ohio – found, similar to the above studies, that children from lower income families start catching up to their middle income peers when they attend a pre-school program (Jacobson, 2003). Finally, a recent report from the Alhambra School District in Arizona came to similar conclusions. This district, where 87 percent of students qualify for free or reduced-price lunch and 51 percent are English language learners, offered preschool to 600 young children and full-day kindergarten to 1200 children, some participating in both programs. Tracking the impact through grades 3 and 5, the results show that the students receiving preschool services in addition to full-day kindergarten outscored similar students who did not.

Given these research findings, the Committee recommends that the state fully fund full-day preschool for 3 and 4 year olds from families with an income at or below

200 percent of the poverty level. According to the National Association for the Education of Young Children, pre-school standards generally call for one teacher and one teacher assistant for each pre-school group of 15 students.

Because pre-school quality is linked to impact, and quality is largely a function of staff, including pre-school students in a district's pupil count for state aid purposes is the most straight forward way to fund pre-school services and would require pre-school providers to pay a salary according to the salary schedule in the district in which the pre-school program is provided, or consistent with the state's average teacher salary. In this way, pre-school providers would be able to recruit highly-qualified teachers for all preschool programs. At the same time, if this funding and salary approach were followed, districts should be required to allow multiple institutions and organizations to provide pre-school services, not just the public schools.

The Committee does not make any more specific recommendations on preschool programs, other than the above, because the Arizona School Readiness Board has recently made a series of recommendations – including state support for preschool services for children aged 3 and 4 from lower income families – for improving the conditions of children from birth to five. The Committee generally supports those recommendations, including the preschool recommendations. Since these initiatives will likely be dealt with outside the K-12 context, the Committee also does not include a separate pre-school cost estimate, deferring to the judgments and cost estimates of the Readiness Board.

## **Full Day Kindergarten**

Research further shows that **full-day kindergarten**, particularly for students from low-income backgrounds, also has significant, positive effects on student learning in the early elementary grades, particularly for children from lower income backgrounds (Fusaro, 1997; Slavin, Karweit & Wasik, 1994). Children participating in such programs do better in learning the basic skills of reading, writing and mathematics in the primary grades of elementary school than children who receive only a half-day program or no kindergarten at all. The most recent study of such effects was released in mid-2003 by the National Center for Education Research (National Center for Education Statistics, 2003). This study 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. This study also found that the more children were exposed to literacy activities in the home, the more likely they were to perform well in both kindergarten and first grade.

Thus, the Committee fully supports the new state commitment to full-day kindergarten programs, particularly for students from lower-income backgrounds. Since recent research suggests that children from all backgrounds can benefit from full-day kindergarten programs, the Committee recommends that the state seek to support a full day program for all students. The most direct way to implement this recommendation is to have the state school finance system allow each district to count each kindergarten student as a full 1.0 student in the formula in order to provide a full-day kindergarten program. Since the legislature has decided to phase-in this program, the Committee supports the strategy of giving the highest poverty areas the top funding priority.

## School Size

Research on **school size** is clearer than research on class size. However, most of the research on school size addresses the question of whether large schools – those significantly over 1,000 students – are both more efficient and more effective than smaller school units (schools of 300 to 500) – and whether cost savings and performance improvements can be identified for consolidating small schools or districts into larger entities. The research generally shows that school units of roughly 400-600 elementary students and between 500 and 1000 secondary students are the most effective and most efficient.

The following is an additional quote from the third edition of the school finance text of our consultants on this issue (Odden & Picus, 2004, Chapter 6):

Analysts, however, argue that the expected cost savings from the massive school and district consolidation have not been realized (Guthrie, 1979; O'Neill, 1996; Ornstein, 1990) and that consolidation might actually harm student performance in rural schools (Sher & Tompkins, 1977) as well as have broad negative effects on rural communities (Coeyman, 1998; Seal & Harmon, 1995). If small schools or districts indeed cost more, but consolidation reduces performance and disrupts communities, the better policy choice might be to resist consolidation and provide special adjustments to compensate for the higher costs.

The research on diseconomies of small and large scale generally does not support a consolidation policy. From an economic perspective, the concept of diseconomies of scale includes both costs and outputs. The issue is whether costs per unit of output are higher in small schools or districts, or put differently, whether costs can be reduced while maintaining output as size rises. In an extensive review of the literature, Fox (1981) concluded that little research had analyzed output in combination with input and size variables, and Monk (1990) concluded after assessing the meager extant research that there was little support for either school or district consolidation.

For elementary schools, research knowledge is thin, but data suggest that size economies that reduce costs by more than one dollar per pupil exist up to but not beyond 200 pupils (Riew, 1986). Thus, very small schools experience diseconomies of small size and, except in isolated rural areas, potentially could be merged into larger ones. But the real opportunities for cost savings from school

consolidation from these small sizes are not great, precisely because many such schools are located in isolated rural areas and there are no other schools nearby with which to consolidate.

At the secondary level, the data are more mixed. Few studies exist that simultaneously assess both size and output, so scale diseconomies have not been adequately studied. Riew (1986) found that there were cost savings, below one dollar per pupil, for middle schools with enrollments above 500; again, many middle schools already enroll more than this number. In analyzing whether larger secondary schools actually provided more comprehensive programs, an argument for larger size, Monk (1987) concluded in a study of New York that program comprehensiveness increased consistently in secondary schools only for size increases up to but not beyond about 400 students. In subsequent research, Haller, Monk, Spotted Bear, Griffith, & Moss (1990) found that while larger schools offered more comprehensive programs, there was wide variation among both smaller and larger schools, and there was no clear [size] point that guarantees program comprehensiveness. Further, Hamilton (1983) shows that social development is better in small high schools.

Studies of district size generally analyze expenditures per pupil as a function of size without an output variable, such as student achievement (Fox, 1981). To document diseconomies of district size, however, expenditures, size, and output need to be analyzed simultaneously, since the goal is to determine if costs per unit of output decrease as the number of students in the district increases. Again, in reviewing the literature, Monk (1990) concluded that definitive statements could not be made about district consolidation.

In the most recent review of scale economies and diseconomies, Andrews, Duncombe & Yinger (2002) assessed both cost function and production function research. The studies reviewed generally assessed costs in tandem with student achievement outputs. The authors concluded that there were potential but modest cost savings that could be realized by consolidating districts smaller than 500 students into districts with 2,000-4,000 students; of course this would be an option only for small districts a short distance from each other and not for rural, isolated small districts. The authors also found that the optimum size for elementary schools was in the 300-500 pupil range, and for high schools was in the 600-900 range (see also, Lee & Smith, 1997, on high school size). Both findings suggest that our very large urban districts and schools are far beyond the optimum size and need to be somehow downsized.

In other words, research suggests that elementary school *units* be in the range of 400-500 students and that secondary school *units* be in the range of 500-1000 students (Lee & Smith, 1997; Raywid, 1997/1998). Evidence from comprehensive school

designs, however, generally propose school sizes of about 500 students for both elementary and secondary schools, which we would argue falls within the range of the research findings (Odden, 1997; Stringfield, Ross & Smith, 1996). Such school designers also suggest that larger schools be divided into “sub-schools,” and run as “schools within schools.” So a secondary school with 2,000 students would be organized into two, 1000-student or four 500-student “sub-schools,” each with a separate student body, separate principal, and separate entrance, if possible (see also Murphy, Beck, Crawford, Hodges & McGaughy, 2001). Teaming within larger schools is another way to enhance personalization of the social and academic environment for students.

Though some of the research on “schools within a school” is mixed, the bulk of research shows that when such efforts *are implemented well*, student performance and other outcomes do rise. Arizona has several excellent examples of effective schools-within-schools. The recent Borman, Hewes, Overman and Brown (2003) meta-analysis of comprehensive school designs, many of which are implemented as schools within school buildings, is one body of evidence. A policy brief by Wonacott (2002) from the Career and Technical Education National Dissemination Center provides an overview of the impacts of smaller learning communities generally and specifically for secondary career academies. The small-school initiative of the GATES foundation is another support for smaller schools; indeed; GATES is providing tens of millions of dollars all around the country for large high schools to break themselves into small school units (see Dobbs, 2003, for example).

Arizona, however, presents a somewhat unique circumstance for identifying school size. Astute readers would have noted that the above conclusions were for school

units, not necessarily school buildings. And Arizona already has built numerous school buildings larger than the above numbers. Evidence on effectiveness would suggest that the state build smaller school buildings, but this would increase the cost of education facilities. Further, some parents and students prefer large school buildings, believing such schools offer a larger variety of courses, and more extra curricular activities. At the same time, some districts in Arizona have built school buildings of a variety of sizes, reflecting the above research findings. Finally, for those who want students to attend school in small buildings, Arizona also offers a large number of charter schools.

Thus, for several reasons, the Committee understands that Arizona may continue to construct many large school buildings. Going forward, the Committee also would recommend that the state consider building additional smaller school buildings. The Committee also suggests that districts divide some but not all of these large buildings into smaller school-units, thus providing smaller, and more personalized learning environments for some students. And the Committee further suggests that parents and students be allowed to attend their school of choice: a large comprehensive high school, a school within a larger school building, as well as a Charter school. In this way, Arizona can continue to construct buildings as economically as possible but provide parents and children options for the “size” of the educational environment in which students are educated. This is consistent with the choice philosophy that operates in Arizona.

Although the Committee recognized that the above level of school choice may not in fact exist in sparse, rural areas, and that in lower income areas, parents often do not have the time or resources to avail themselves of choice were it to be provided, it believed its conclusions about the issue of school size were sound, nevertheless.

To indicate the relative level of resources in schools, the Committee uses prototypic school units of 500 students at the elementary (K-5), 500 students at the middle (6-8) and 500 students at the high school (9-12) levels.

In addition, for secondary schools, research also finds that curriculum offerings should emphasize a solid core of academic classes for all students (Bryk, Lee & Holland, 1993; Lee, Croninger & Smith, 1997; Newmann & Associates, 1996). Indeed, this research shows that the most effective strategy for having all students perform to proficiency on state standards and to close the achievement gap between minorities and non minorities is for high schools to offer a strong set of core academic courses in mathematics, science, language arts, history/social science and foreign language and require all students to take the bulk of their courses from this core (Clune & White, 1992; Lee, Croninger & Smith, 1997; Madigan, 1997; Public Agenda, 1997; Steinberg, 1997). Indeed, the Education Trust argues that one of the top two strategies for closing the achievement gap between low-income students and students of color from other adolescent Americans is having high schools prepare all students for college, i.e., to take a core of solid academics (Education Trust, 2003).<sup>3</sup> As noted in the introduction to this report, this is the kind of secondary education required for full participation in any and all post-high school activities, whether it is taking a job, enrolling in a two year post secondary institution, or attending a college or university.

### **Class Size**

Research on class size shows that **small classes of 15** (not 18, not 20, and not a class of 30 with an instructional aide or two teachers) **in kindergarten through grade 3**

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<sup>3</sup> The other strategy is to provide a quality teacher in every classroom, a topic addressed later in this report.

have significant, positive impacts on student achievement in mathematics and reading (Achilles, 1999; Gerber, Finn, Achilles & Boyd-Zaharias, 2001; Grissmer, 1999; Mishel & Rothstein, 2002; Molnar, 1999). It is commonly also concluded that the impact of small class size is even larger for students from low-income and minority backgrounds (Finn & Achilles, 1999; Krueger & Whitmore, 2001). Thus, class sizes should be 15 in grades kindergarten through grade 3. Although one research study shows that the student performance impact of small class sizes is substantial for all students (Nye, Hedges & Konstantopoulous, 2002), the vast majority of analysts have concluded that the largest effects of small class sizes are for low income and minority students, suggesting that limiting class size reduction to schools with the highest concentrations of low income/minority students could provide the largest public benefit for an expensive policy.

We recognize that different analysts have reached different conclusions on the role of resources generally and specifically the role of class size on student achievement. In a late 1970s meta-analysis of the class size research, Glass and Smith (1979) concluded that class sizes needed to be reduced to at most 15 students before an impact on achievement could be produced. However, in a re-analysis of that research, Odden (1990) noted that Glass and Smith had no sample studies of class sizes of 14-17 that actually improved student achievement, and that the class size of 15 finding was a statistical artifact of little if any impact of class size until individual tutoring was provided. And Hanushek (2002) has always questioned small class size.

But research in the late 1980s and early 1990s provided new evidence of the impact of class size on achievement. The “gold” standard of educational (or any other impact) research is randomized experiments, 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 experiment on class sizes of 15 for kindergarten through grade 3 (Word, et al., 1990). The results showed that students in the small classes achieved at a significantly higher level than those in regular class sizes, and that the impacts were even larger for low income and minority students (Achilles, 1999; Finn, 2002; Grissmer, 1999; Krueger, 2002). The same research showed that a regular class of 24-25 with a teacher and an instructional aide did not produce a discernable positive impact on student achievement, a finding that undercuts proposals to and wide spread practices that do place instructional aides in elementary classrooms (Gerber, Achilles, & Boyd-Zaharias, 2001).

Though some have argued that the class size impact was produced only in the Kindergarten years (Hanushek, 2002), that argument is only a conjecture since the experiment was for small class sizes for all of grades Kindergarten through grade 3.

Subsequent research showed that the positive impacts of the small classes in the Tennessee study persisted into middle and high school years, and even the years beyond high school (Finn, Gerger, Achilles & J.B. Zaharias, 2001; Krueger, 2002; Mishel & Rothstein, 2002; Nye, Hedges & Konstantopulos, 2001a, 2001b). Thus, although 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 does make a difference; but we conclude that the research shows only that class sizes of 15 students and only for kindergarten through grade 3 boost student performance (Achilles, 1999; Finn, 2002; Grissmer, 1999; Krueger, 2002).

Similar research with similar findings on the effect of class of 15 for students in kindergarten through grade 3 was produced for Project Prime in Indiana (Chase, Mueller & Walden, 1986).

Following California's experience, we would urge the state to phase-in these smaller class sizes to insure that quality teachers were available to staff those classes; California discovered that a fast phase-in required many districts, particularly the large urban districts, to staff class with unqualified teachers, which detracted from the efficacy of the small class size.

Evidence on the most effective class sizes in grades 4-12 is harder to find. Most of the research on class size reduction has been conducted at the elementary level. Thus, we look for evidence on the most appropriate secondary class size from typical and best practices to make a recommendation for class sizes for these grades. First, the national average class size in middle and high schools is about 25. Second, nearly all comprehensive school reform models are developed on a class size of 25 (Odden, 1997; Odden & Picus, 2000; 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 other states have recommended secondary class sizes of 20, none cited research or best practices to under gird such a proposal. Thus, we use evidence of best practice to recommend that class sizes in grades 4-12 should be no larger than an average of 25.<sup>4</sup>

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<sup>4</sup> Many in Arizona and other states have argued not to bump class size from 15 in grade 3 to 25 in grade 4 and subsequent grades, and that class sizes in those grades should be closer to 20. We would encourage the state to sponsor some experiments with various class sizes in grades 4-12 to see if smaller sizes would indeed impact student performance. Whatever the results, the conclusions could provide stronger evidence for what size classes should be at those grade levels.

With these class size recommendations, a K-5 elementary school of 500 students would need about 22 teachers for grades K-3 and 6-7 teachers for grades 4 and 5; middle and high school units of 500 students would need 20 core content area teachers. We hasten to note that these core teachers would not be the only teaching or professional staff in such schools. Several of the following sections recommend a variety of additional teachers for all school levels.

### **Principal**

**Each school unit needs a principal.** This recommendation simply reflects current practice. All comprehensive school designs, and all prototypic school designs from professional judgment studies around the country, include a principal for every school unit. However, few if any comprehensive school designs include assistant principal positions. And very few school systems around the country provide assistant principals to schools with 500 students or less. Since we also recommend that instead of one school with a large number of students, school buildings with large numbers of students should be sub-divided into school units within the school, we recommend that each unit should have a principal. This implies that one principal would be required for each school unit.

School buildings with 2 or more school-unit principals could organize themselves so there was one “super-ordinate” principal in charge. And larger schools with several schools within a school could field combined athletic teams. Our point in providing resources is simply to provide resources for groupings of 500 students in prototypic elementary, middle and high schools, with such resources to include a principal-level position for each of those school units.

## **Instructional Facilitators/School-Based Coaches/Mentors**

Most comprehensive school designs, and the Evidence-Based adequacy studies conducted by the consultants in Kentucky (Odden, Fermanich & Picus 2003) and Arkansas (Odden, Picus & Fermanich, 2003), call for **school-based instructional facilitators** (sometimes called mentors, site coaches, curriculum specialists, lead teachers); and the technology intensive designs also require a technology coordinator (see Stringfield, Ross & Smith, 1996). Further, several designs suggest that while one facilitator might be sufficient for the first year implementation of a school wide program, in subsequent years an additional 0.5 to 1.0 facilitator would be needed. In addition, the technology 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 about 2.5 instructional facilitators/technology coordinators are needed for each school unit of 500 students. This resourcing strategy works for elementary as well as middle and high schools. High schools could turn these resources into several part-time department chairs, or use them as school-wide instructional support resources.

These individuals would coordinate the instructional program and provide the important ongoing coaching and mentoring that the professional development literature shows is so critically necessary for teachers to change and improve their instructional practice (Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Showers, 2002). This means that they spend the bulk of their time in classrooms, modeling lessons, giving feedback to teachers, and helping improve the instructional program. We expand on the rationale for these individuals in our professional development section below. The technology staff would provide the technological expertise to fix small problems with the

computer system, install all software, connect computer equipment so it can be used for both instruction and management issues, and provide professional development to embed computer technologies into the curriculum.

### **Specialist Teachers and Planning and Preparation Time/Collaborative Professional Development**

Teachers need some time during the regular school day for collaborative planning, job-embedded professional development, and ongoing curriculum development and review. Schools also need to teach art, music, library skills, vocational and physical education. Providing each teacher one period a day for collaborative planning and professional development focused on the school's curriculum requires an additional 20 percent allocation of teachers to those needed to provide the above class sizes. These teachers could teach the above or other specialist content classes.

The 20 percent more staff is probably adequate for elementary and middle schools, but a different argument could be made for high schools. If the goal is to have more high school students take a core set of rigorous academic courses, and learn that material at a high level of thinking and problem solving, one could argue that a block schedule that allows for longer class periods would be a better way to organize the instructional time of the school. And typical block scheduling for high schools generally requires an additional 33 percent of specialist teachers, as the school creates a four 90-minute block schedule, with teachers providing instruction for just three of those 90-minute blocks and having one block – or 90 minutes – for planning and preparation each day. This type of block schedule could be operated with students taking four courses each semester so attending the same classes each day, or with students taking eight courses each semester so attending different classes every other day. Such a schedule

could also entail some “skinny” blocks for some classes. Each of these specific ways of structuring a block schedule, however, would require an additional 33 percent of specialist teachers to provide the regular teacher with a “block” for planning and preparation each day. Based on the findings from cognitive research on how kids learn complex materials (Bransford, Brown and Cocking, 1999), which suggest longer more concentrated times for learning, and the rigorous but needed performance expectations for high school students in Arizona, we would recommend such a block scheduling for high schools, and thus more specialist teachers for high schools to permit this scheduling. Block schedules also would allow teachers of English and writing to give more writing assignments and have the time to provide detailed feedback to students, which is needed to help students write better, but is very time consuming with large numbers of students. We should note that a school could provide 60 minutes of this preparation time for planning, preparation and collaborative work with colleagues, and also require that teachers use 30 minutes of this time to provide additional help for struggling students, which could be organized in many different ways by a school.

We should also note that the primary way to provide job-embedded professional development is to provide for and use a significant portion of planning and preparation time within the normal school day for this purpose (see Odden and Archibald, 2001 for examples). This means that the planning and preparation time needs to be provided as 45-60 minutes of uninterrupted time, not 15-30 minutes at different times during the day. Such professional development should provide between 100 and 200 hours of professional development annually for each teacher (we would recommend closer to 200 hours), should include extensive coaching in the teacher’s classroom (provided by the

site-based instructional facilitators/coaches/mentors discussed above), should include all faculty in a school, should focus heavily the content and curriculum that each teacher teaches, and should be aligned with state/district content standards and student tests (Birman, Desimone, Porter & Garet, 2000; Cohen & Hill, 2001; Desimone, Porter, Garet, Yoon, & Birman, 2002, Desimone, Porter, Birman, Garet & Yoon, 2002; Garet, Birman, Porter, Desimone & Herman, 1999). Again, we expand on the structure and costs of effective professional development below.

### **Strategy for Struggling Students**

Every school should have a **powerful and effective strategy for struggling students**, *i.e.*, students who must work harder and who need more time and help to achieve to proficiency levels. Such students generally include those from lower income backgrounds, those struggling to learn English, and those with learning and other mild disabilities. The most powerful and effective strategy is individual one-to-one tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). The standard of many comprehensive school designs is a ratio of one fully licensed teacher-tutor for every 20 percent of students in poverty, with a minimum of one for every school. Thus, school units of 500 students should have from one to five professional teacher tutor positions. Schools could deploy these resources in ways other than individual tutoring, though considerable research suggests tutoring is the most effective strategy.<sup>5</sup>

We note several characteristics of this tutoring strategy. First, each tutor would tutor 1 student every 20 minutes, so could tutor 3 students an hour. This would allow one tutor position to tutor 18 students a day. (Since tutoring is such an intensive activity,

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<sup>5</sup> In the matrix recommended by the Committee, funding for these staff are estimated using a ratio of one teacher tutor position for every 100 students who qualify for free and reduced price lunch.

individual teachers might spend only half their time tutoring; but a 1.0 tutoring position would allow 18 students a day to receive 1-2 tutoring.). Five positions would allow 90 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. So with modest such changes, nearly half the student body of a 500 pupil school unit could receive individual tutoring some time during the year. Third, not all students from a lower income background require individual tutoring.

Given all of the above recommendations, we want to note the multiplicity of recommendations focused on getting students to read proficiently by the end of the third grade:

- Preschool for children from lower income backgrounds.
- Full day kindergarten, at least beginning with those same students.
- Classes of just 15 students for the first three years of school, K-3.
  - Perhaps even smaller classes if schools had all licensed staff in an elementary school teach reading during a 90 minute reading block.
- Hopefully at least 90 minutes of reading instruction daily.
- An Evidence-Based reading curriculum, with a balance of phonics, phonemic development, writing and comprehension.
- More effective teachers with access to rigorous professional development.
- Individual tutoring if all of the above still leave the student struggling.

In sum, our proposal for immediate and intensive extra help for all students struggling to learn to standards comes “after” a series of other Evidence-Based strategies, all designed and proposed to help the student learn to proficient performance standards.

English language learning students. With the exception of having extra teachers to teach English as a Second language to students for whom English is not their primary language, the tutoring strategy is almost but not quite adequate for schools with English language learners. Research shows that it is the English language learners from lower income, and generally less educated backgrounds, that struggle in school and need extra help. Triggering tutoring resources on the basis of the economic background of students would provide most of the extra help resources needed for such struggling English language learners.

However, best practices and experience also show that when students are both from a low-income background and English language learners (ELL), some additional assistance is needed beyond that just for poverty. Thus the Committee recommends that every 100 students who are both ELL and from a poverty family trigger an additional 1.4 teacher positions, rather than the 1.0 if just from a poverty family.

Indeed, these recommendations combined with all other recommendations “square” with a recent study of what is needed to help English language learners achieve to high performance standards (Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003). That study concluded that ELL students need:

- Qualified teachers – a core goal of all the recommendations in the report
- Adequate instructional materials and good school conditions, another core goal of adequate funding
- Good assessments of ELL students so teachers know in detail their English language reading and other academic skills, and less segregation of ELL students

- Rigorous curriculum and courses for all ELL students, and affirmative counseling of such students to take those courses
- Professional development for all teachers, focusing on sheltered English teaching skills.

Students with disabilities. This allocation for poverty and ELL students would need to be augmented with additional teacher positions to provide extra help for students with mild and moderate disabilities, as well as with speech and hearing handicaps, what Arizona calls Group A special students. Arizona has already joined several other states in designing and implementing a state-of-the-art funding approach for these students with disabilities. The progressive approach today is called a “census” approach to providing such resources. This approach, which can be simply embodied in a higher expenditure for an adequate foundation-type school finance formula, assumes the incidence of these categories of disabilities is approximately equal across districts and schools and includes resources for providing needed services at an equal rate to all schools and districts. The way Arizona implements this approach is by identifying the preceding groups of students as Group A students and providing an extra 0.16 weight for all students in the state’s foundation formula; the extra weight is actually 0.158 for K-8 students (which we have rounded to 0.16) and 0.268 for 9-12 students, but about 0.11 of this weight is for higher costs of high schools. In other words, Arizona now weights all students about an extra 0.16 to trigger additional resources for moderately disabled students.

The census approach has 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.

Moreover, all increases in federal funding for disabled students are to be distributed on a “census” basis. As a result, diverse states such as Arkansas, Arizona, California, and Vermont have moved to provide resources for students with mild disabilities through this strategy.

Thus the Committee recommends that Arizona retain this simpler approach and weight each student in the prototypic elementary, middle and high school and additional 0.16 in order to trigger resources for the moderately disabled, or Group A, student. Though the recent cost study conducted by the Arizona Department of Education (2004) found that the current weight under funds the program, a higher foundation expenditure base, which would be the result of the recommendations of this report, would remedy that shortfall. The level of these resources could be lower for Charter Schools, as those schools have a much lower incidence of special needs students than do schools administered by districts.

The small category of students with severe and multiple disabilities, *i.e.*, the low incidence and very high cost disabled students, called Group B students in Arizona, are not found in equal percentages in all districts and their excess costs need to be fully funded by the state. The way to do this is to continue the much larger weights for Group B disabled students, except the categories of K-3 and ELL, as the additional needs for

these students are addressed above. For very small school districts, the state should also consider an additional “catastrophic fund” that would provide additional financial help when the actual costs for such students exceeded 150 percent of funded reimbursements.

Use of these funds. Schools should be free to use all these resources for struggling students for whatever educational strategy they select, including a different type of tutoring strategy, or extra help before or after school, on Saturdays or even during the summer. But given these substantial additional resources to meet the needs of struggling students, schools and districts should be held accountable for having these students, except for the severely disabled, learn to state proficiency levels.

### **Gifted, Talented, Able and Ambitious Students<sup>6</sup>**

A sound analysis of educational adequacy should **include the gifted, talented, and able and ambitious student**, most of whom perform above state proficiency standards. Indeed, this is important for Arizona as the Arizona LEARNS accountability program requires improved performance for students at all levels of achievement, not just that all students achieve to or above a proficiency standard. 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 (Baum, Owen

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<sup>6</sup> This section is based on an unpublished literature review written by Dr. Ann Robinson, Professor, University of Arkansas at Little Rock.

& Oreck, 1996; VanTassel-Baska, Johnson & Avery, 2002), nonverbal measures (Naglieri & Ronning, 2000; Naglieri & Ford, 2003), open-ended tasks (Scott, Deuel, Jean-Francois & Urbano, 1996), extended try-out and transitional periods (Borland & Wright, 1994; Maker, 1996), and inclusive definitions and policies (Gallagher & Coleman, 1992) document increased and more equitable identification practices for high ability culturally diverse and/or low-income learners. However, identification is not sufficient; it must be accompanied by services (Rito & Moller, 1989). 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 than a comparable group of high ability students who did not participate (Struck, 2003). Gains on other measures of school achievement were reported as well.

Access to Curriculum. Overall, research shows that curriculum programs specifically designed for talented learners produce greater learning than regular academic programs. Increase in the complexity of the curricular material is a key factor (Robinson & Clinkenbear, 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, J., 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 learners 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 they already know) 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 (Kulik & Kulik, 1984; Southern, Jones & Stanley, 1993), including Advanced Placement classes (Bleske-Rechek, Lubinski & Benbow, in press). Other studies report participant satisfaction with acceleration (Swiatek, 2002) and benign effects on social and psychological development (Rogers, 2002).

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; Westberg, Archambault, Dobyms & Salvin, 1993),

even though talented students have mastered 40 to 50 percent of the elementary curriculum before the school year begins (Reis et al, 1993). In contrast, teachers who receive appropriate training are more likely to provide classroom instruction that meets the needs of talented learners; students report differences and independent observers in the classroom document them (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 facilitators recommended above (Reis et al, 1993; 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 (Delcourt, Loyd, Cornell & Golderberg, 1994), which could be accomplished with the professional development resources recommended below.

The Committee strongly recommends that the needs of Arizona's gifted, talented, able and ambitious students be met. But the Committee also concludes that additional funding, beyond that included in all of the combined recommendations in this report, is not needed, and that the overall level of resources recommended can be deployed at schools in ways to fully provide for the special needs of gifted and talented students.

Indeed, some of the proposals already made are directly related to the above recommendations for able and ambitious students, such as intensive professional development. Curriculum acceleration, moreover, requires more student placement and scheduling than more resources. Further, several proposals that might not have a specific rationale for gifted, talented and able and ambitious students nevertheless will positively impact them as well, such as:

- Classes of 15 students in grades K-3
- Classes of 25 in grades 4-12
- Smaller school size, and smaller schools-within-schools, so a more personalized learning environment would help the teacher identify and respond to gifted, talented, and able and ambitious student needs
- The intensive professional development that over time should include skills to differentiate instruction for the needs of all children, including the top learners
- Improved classroom instruction that focuses on ambitious learning goals of learning to understanding.

Further, all school-based student performance award programs can be designed to include elements on improved performance of the top learners, as well as those at the low end. In sum, the Committee believes that the overall list of Evidence-Based proposals in the report are sufficient for the needs of the state's gifted, talented, and able and ambitious students.

The Committee also notes that the census student weight for Group A special needs students, which the Committee recommends to be continued, was designed to include whatever extra resources would be needed for the top students. .

### **Alternative Learning Environment**

Some students have difficulty learning in the traditional school environment. These students, many of whom have significant behavioral, social and emotional issues, often do much better in small "alternative learning environments." The professional judgment panels strongly agreed with the need for these alternative school structures, and nearly all districts represented had various versions of "alternative learning

environments” for such students. However, Arizona does not now collect data on the numbers of these students in each district, so it is difficult to identify the costs of such a program. However, assuming that 1.5 percent of grade 9-12 students would need such a program, and staffing the program at one professional staff for each 8 students, or 3 staff for groups of 24 students, a rough cost estimate for ALE programs would be \$23.8 million. Since this is a rough estimate based on an assumption of the number of students, it is not included in any of the following total cost figures, but it is a program initiative the Committee concludes should be on the Arizona education landscape.

### **Student Support/Family Outreach**

Schools also need a **student support and family outreach strategy**. Various comprehensive school designs have suggested different ways to provide such a program strategy (Stringfield, Ross & Smith, 1996; for further discussion, see Brabeck, Walsh & Latta, 2003). In terms of level of resources, the more disadvantaged the student body, the more comprehensive the strategy needs to be. The general standard is one licensed professional for every 20-25 percent of students from a low-income background, with a minimum of one for each school.<sup>7</sup>

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 activities that impact 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, which Arizona’s does, helping parents and students to understand both what needs to be learned and what constitutes acceptable standards for academic

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<sup>7</sup> In the matrix recommended by the Committee, funding for these staff are estimated using a ratio of one teacher tutor position for every 100 students who qualify for free and reduced price lunch, with a minimum of one per school.

performance would be helpful. Put succinctly, parent outreach that explicitly and directly addresses what parents can do to help their children learn, and to understand the standards of performance that the school expects, are the types of school-sponsored parent activities that produce discernible impacts on student's academic learning (Steinberg, 1996, 1997).

At the secondary level, the goal of such activities should be to have parents learn about what they should expect of their children in terms of their learning and academic performance in secondary school. If a district or a state required a minimum number of courses for graduation, that requirement should be made clear. Further, if there were similar or more extensive course requirements for admission into state colleges and universities, those requirements should be addressed. Finally, if either average scores on end-of-course examinations or a cut-score on a comprehensive high school test were required for graduation, they too should be discussed. The point is that secondary schools need to help many parents know how to more aggressively assist their children in determining both an academic pathway through middle and high school, expectations for acceptable standards for performance, and at the high school, an understanding of the course work necessary for college entrance.

At the elementary school 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 the parent-teacher organization, 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. Parents actions that impact learning would be to: 1) read to them at young ages, 2) discuss stories and their meanings, 3) engage in open ended conversations, 4) set aside a place where homework can be done, and 5) ensure that their child completes homework assignments.

In addition, middle and high schools need some level of guidance counselor resources. We generally recommend 1 guidance counselor for the middle school and 2 for the high school, each of 500 students, based on professional standards for staffing. Indeed, at the secondary level, the American School Counselor Association recommends 1 counselor for every 250 students.

Readers should note that this recommendation provides substantial and adequate resources for parent outreach and involvement, as well as counseling for students. For an all poverty school, our recommendations would provide 5 staff positions for an elementary school (so it could have a nurse, counselor, social worker, psychologist and parent liaison team) and the same staff plus one additional counselor at the middle school and an additional two counselors for the prototypic high school.

The resources are adequate to create and deploy the ambitious and comprehensive parent involvement and outreach programs that are part of two comprehensive school designs: Roots and Wings/Success for all and the Comer School Development Program. The Roots and Wings program would include a family outreach coordinator, a nurse, social worker, guidance counselor and education diagnostician. This group would function as a parent outreach team for the school, would serve as case managers for students who needed non-academic and social services of whatever sort, and usually also

include a clothing strategy to ensure that all students, especially in cold climates, had sufficient and adequate clothes, and coats, to attend school.

The Comer Program is created on the premise of attaching schools more to their communities. It's Parent-School team would have a somewhat different composition and would be focused on training parents to raise expectations for their children's learning, to work with social service agencies and sometimes to even co-locate on school site premises the provision of a host of social services, and to work with the school's faculty to raise their expectations for what students can learn.

All effective parent outreach programs would have several workshops training parents on what specifically they could do at home to help their children learn.

### **Intensive Professional Development<sup>8</sup>**

All school faculties need **ongoing professional development**. Indeed, improving teacher effectiveness through high quality professional development is arguably as important as all of the other resource strategies identified; better instruction is the key aspect of the education system that will improve student learning (Rowan, Correnti & Miller, 2002; Sanders & Horn, 1994; Sanders & Rivers, 1996; Webster, Mendro, Orsak & Weerasinghe, 1998).

Moreover, all the resources recommended in this report need to be transformed into high quality instruction in order to transform them into increases in student learning (Cohen, Raudenbusch & Ball, 2002). And effective professional development is the primary way those resources get transformed into effective and productive instructional practices. Further, as we have stated many times, while the key focus of professional development is for better instruction in the core subjects of mathematics,

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<sup>8</sup> This draws from Odden, Archibald, Fermanich & Gallagher, 2002.

reading/language arts, history and science, the professional development resources are adequate to address the instructional needs for gifted and talented and English language learning students, and for embedding technology in the curriculum as well. Finally, all beginning teachers need intensive professional development, first in classroom management, organization and student discipline, and then in instructional strategies.

Fortunately, there is recent and substantial research on effective professional development and its costs (e.g., Elmore, 2002; Joyce & Showers, 2002; Miles, Odden, Archibald, Fermanich & Gallagher, 2002). Effective professional development is defined as professional development that produces change in teachers' classroom-based instructional practice, which 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. These studies include, among others, the long-term efforts of Bruce Joyce (Joyce & Calhoun, 1996; Joyce & Showers, 2002), research on the change process (Fullan, 2002), a longitudinal analysis of efforts to improve mathematics in California (Cohen & Hill, 2001), Elmore's study of District #2 in New York City (Elmore & Burney, 1999), the Consortium for Policy Research in Education longitudinal study of sustained professional development provided by the Merck Institute for Science Education (Supovitz & Turner, 2000), studies of comprehensive professional development to improve science teaching and learning (Loucks-Horsley, Love, Stiles, Mundry & Hewsen, 2003), and an evaluation of the

federal Eisenhower mathematics and science professional development program (Garet, Birman, Porter, Desimone & Herman, 1999).

Combined, these studies identified six structural features of effective professional development:

- 1) 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.
- 2) 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.
- 3) 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 (e.g., Garet, Birman, Porter, Desimone & Herman, 1999).
- 4) 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 (Bransford, Brown & Cocking, 1999; Kennedy, 1998).
- 5) 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 and “perfecting” 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 (e.g., Joyce & Showers, 2002).
- 6) 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. Active learning implies some degree of 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 in the school to teach this content. Collective participation implies that the best professional development includes groups of and at some point all teachers in a school, who then work together to implement the new strategies, and in the process, help build a professional school 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. 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 and all-teachers-in-the-school 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 costs.

From this research on the features of effective professional development, we conclude that the resources needed to deploy this kind of professional development, which is key to transforming all the resources we recommend into student learning, are:

a. **Time during the summer for intensive training institutes.** This training can most easily be accomplished by ensuring that approximately 10 days of the teacher's normal work year will be dedicated to professional development. Due to the fact that the current average number of Arizona annual teacher work days is about 186, and includes about 4 days for professional development, this recommendation requires an increase of 6 days, to produce the minimum number of 10 days for intensive training.

b. **On-site coaching for all teachers** to help them incorporate the practices into their instructional repertoire. The instructional facilitators described earlier in this report would provide this function.

c. **Collaborative work with teachers in their schools during planning and preparation periods** to improve the curriculum and instructional program, thus

reinforcing the strategic and instrumental need for planning and preparation time during the regular school day. This will require smart scheduling of teachers during the regular school day and week.

d. **Funds for training** during the summer and for ongoing training during the school year, the cost of which is about \$25,000 for a school unit of 500 students, or \$50/pupil.

Thus, for professional development:

- The number of teacher days should be extended by 6 days to provide a total of 10 days for intensive summer institutes. This additional training will be costed at the average daily cost for a teacher (\$200 a day, which equals the average teacher salary in 02-03 school year of about \$41,000 divided by 205 days), plus social security and pension costs
- The instructional facilitators included above should provide coaching
- Collaborative work should be conducted during the planning and preparation time that is included above, and
- An additional \$50 per student, or about \$25,000 in a 500-student school unit, would be needed for trainer and other miscellaneous professional development costs.

## **Technology**

Over time, schools need to **embed technology in instructional programs and school management strategies**. Recent research reviews, moreover, have documented a positive impact on student test scores of curriculum programs that embed technology into the instructional delivery system. The reviews documented effect sizes from 0.30

(Waxman, Connell & Gray, 2002) to 0.38 of a standard deviation improvement in test scores (Murphy, Penuel, Means, Korbak, Whaley & Allen, 2002), thus approximating the effects of class size reduction in the early grades.

Based on school designs that include such technology, cost studies of technology that have been conducted by several states and conducted as part of several professional judgment studies, the costs for a school unit of 500 students are about \$125,000, or \$250/student, for purchase, update, and maintenance of hardware and software, which for at least the next decade should be viewed as an annual operating cost (Odden, 1997).

Fortunately, Arizona has developed a substantial technology infrastructure over the years, so most if not all schools are linked to the Internet and to district offices and/or a state network. At school sites, however, investments in computer hardware and software are too often conceived as one-time capital expenditures, whereas in reality most computer related-technologies need to be maintained, fixed, upgraded and replaced over time.

From estimates of these costs, both from several technology heavy comprehensive school designs (Odden, 1997) and from estimates in the state of Kentucky (see Odden, Fermanich & Picus, 2003), the Committee recommends a figure of \$250 per student. This should be sufficient to keep local technology working and updated and for schools to have an overall ratio of one computer for every 3 students. For clarity, the latter ratio would be sufficient to provide every teacher, the principal and other key school level staff with a computer, and to have an actual ratio of about 1 computer for every 4 students in each classroom. This level of funding would also allow for the technology infrastructure needed for distance learning programs.

We should note that these resources would be used effectively only if the professional development, funded above, provides training to teachers and administrators in how to embed technology into the instructional and management programs of each school. As noted earlier in this report, a partial role for at least one of the instructional facilitators is to have the skills to install software programs on a school's network and its computers, to be the onsite expert who can fix modest network and computer problems, and who can help teachers and administrators use the technology equipment effectively.

### **Other Resources**

As should be clear, the above recommendations do not include all the resources that schools require. This section makes recommendations on the following items:

- Additional positions for librarians in middle and high schools
- Resources for substitute teachers
- A per pupil amount for instructional materials, supplies, equipment, and student activities, including athletics for middle and high schools
- Supervisory and safety personnel
- Operations and maintenance, and clerical staff.

Librarians. According to state regulations, every school must have a library. However, modern technologies allow schools to operate a library with more computer technologies, included above, and less staff. Further, many elementary librarians teach students for much of the day as part of special subject offerings. Thus, the Committee recommends that librarian resources be taken from the specialist teacher allocation for elementary schools, and that a 1.0 allocation for library/media staff be provided for middle and high schools.

Substitute teachers. Schools need some level of substitute teacher allocations. Based on other studies, the Committee recommends that each school receive an amount of money equal to 10 days for each regular classroom and specialist teacher, funded at the level of \$100 per day, plus social security and state retirement benefits, for a total of \$121 per day. This recommendation does not mean that each teacher is provided ten substitute days a year; it means the district needs a “pot” of money approximately equal to 10 substitute days per year for all teachers, in order to cover classrooms when teachers are sick for 1-2 days, absent for other reasons, on long term sick or pregnancy leave, etc. This recommendation also is not for 10 days above what is currently provided; it simply is a recommendation for an amount of money for substitute teachers estimated at 10 days for each teacher on average.

Instructional materials and supplies, excluding textbooks. Based on recommendations in other states, and the state’s textbook funding policies, the Committee recommends that each school be provided with \$250 per pupil for instructional materials and supplies, excluding textbooks.

Extra duty funds. Middle and high schools typically provide an array of after school programs, from clubs, bands and other activities to sports. Teachers supervising these activities or doing the coaching usually receive small stipends for these extra duties. Further, research shows, particularly at the secondary level, that students engaged in these activities tend to perform better academically than students not so engaged, though too much extra curricular activity can be a detriment to academic learning (Committee on Increasing High School Students’ Engagement and Motivation to Learn, 2004). The

Committee therefore recommends that extra duty funds be provided to middle schools at the rate of \$60/pupil and to high schools at the rate of \$120/pupil.

Supervisory and safety personnel. Elementary and sometimes middle schools need staff to help students get off the bus in the morning and on the bus at the end of the school day. All schools need staff to supervise students during lunch periods. And middle and high schools sometimes need security guards. The Committee recommends \$50/pupil for these support staff. This would be sufficient for having about 20 hours of aide time daily at a rate of slightly less than \$8 an hour.

Instructional aides. Note that there are no instructional aides in the above model, mainly because research generally shows they do not add value, *i.e.*, do not positively impact student academic achievement (Achilles, 1999; 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. There are 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 recent 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 should note that neither of these studies supports the typical use of instructional aides as 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.

Operations and maintenance, and clerical staff. The Committee recommends that current amounts spent for these functions be retained and included in each district's resources. At the school site level, however, the Committee recommends an "executive secretary/administrative assistant" position and clerk position for each school unit of 500 students.

### **Attracting and Retaining the Best Teacher Resources: Market Forces, Teacher Salaries and Performance**

The last step in both the professional consensus and the Evidence-Based approaches to determining adequacy is appropriately pricing all ingredients. This includes setting teacher salary levels. At this step, both procedures often use a statewide average teacher salary, which can miss-specify what the state on average needs to pay for quality teacher talent. Indeed, this is a critically important step in any adequacy study, and too often is not given the attention it needs.

Quality teachers make an enormous impact on student learning (Sanders & Rivers, 1996; Webster, Mendro, Orsak, & Weerasinghe, 1998). The impact of all of the above evidence-based strategies depends on the quality and expertise of the teachers implementing them; lower quality teachers will give them a lower impact – higher quality teachers will give them the impact desired. What Arizona needs is a quality teacher in

each and every classroom in the state, a strategy that will maximize the impact of each of the above programmatic recommendations.

Though ongoing training and professional development and adequately resourced schools are important in recruiting and retaining high quality teachers, the salary level is also a critical factor. As the Governor Hull Task Force recommended, Arizona needs to raise its teacher salary levels to the national average in order to compete for the talent required to accomplish the important student achievement goals embodied in the Arizona curriculum standards, in Arizona LEARNS and in No Child Left Behind.

But, we agree with the Hull Task Force that providing simple, across-the-board salary increases to all teachers will not provide the state with the higher quality teachers it needs. States tried different versions of this strategy in the 1980s and it did not work (Ballou & Podgursky, 1997). Such a strategy simply paid the teachers in the system at a higher level, and even reduced turnover and the ability of new individuals to enter the profession.

What Arizona needs are teacher salary levels that are market-based, at the entry, mid-career and top levels, and provided through performance-based structures – structures that provide higher salaries to teachers that are more effective in producing student learning gains in their classrooms. Such schedules probably will be flatter than most current schedules, will provide a longer teacher work year (as recommended above), and will link base-pay increases to teachers' classroom performance. In other words, the Committee envisions a more professional salary for its needed high quality teachers.

Thus the Committee adopts the Hull Task Force recommendation that teacher salary levels be raised to the national average but in the following way:

- Identify Arizona-based salary benchmarks for beginning, mid-career and top salary levels, and require all districts to have salary schedules that provide these benchmarked levels of pay.
- Create salary structures that link base pay increases over time to teacher performance in the classroom. The Committee believes that the aspirations embodied in Proposition 301, which required each local district to design its own performance-based salary structure, were laudable but did not produce strong enough performance-based salary structures, and that additional work needs to be conducted to create one or more performance-based teacher salary structures that would more effectively meet the spirit of Proposition 301.
- Create higher salary schedules for teachers in different labor markets, such as teachers in subject area shortages (mathematics, science, technology) and/or who work in high poverty urban areas or sparse and geographically isolated rural areas.

Because of enrollment growth, pending retirements and smaller class sizes, Arizona likely will need to hire substantial numbers of teachers in the near to medium term. Thus, the Committee recommends that beginning teacher salaries be raised first, so that districts can compete in the broader labor market when recruiting for education talent.

Second, the committee recommends incentives for teachers in subject area shortages and for teaching in high poverty urban or sparse and geographically isolated rural areas.

Third, the Committee recommends districts use the professional development resources to create an intensive and effective beginning teacher induction and mentoring program, so that all teachers new to the system are systemically helped in learning the instructional and management clinical skills to be effective teachers.

Fourth, the Committee recommends the funding of the extra 6 days for summer training.

And lastly, and only when stronger performance-based salary schedules are created, does the Committee recommend that the state provide the final teacher salary increase to raise overall salary levels to the national average.

In sum, for purposes of this report, the Committee recommends the following:

- Use the 02-03 school year average teacher salary to initially determine the cost of the programmatic proposals. According to the National Education Association (2003), which is the only organization that provides this information, that salary average was \$41,000.
- Estimate the cost of providing an overall teacher salary increase; the Governor's Task Force on Efficiency and Accountability in K-12 Education (2001) used the national average as the benchmark salary target. We estimate this cost to be about \$445 million, and recommend it only for strengthened performance-based salary schedules.
- Provide additional salary incentives for teachers who:
  - work in *sparse, rural areas*
  - work in *low performing-high poverty schools* in urban areas

- and who teach subjects for which there are currently teacher shortages, such as *mathematics, science and technology*.

Research would need to be conducted to determine the appropriate level of such incentives, but it is expected that incentives in the range of 5-10 percent of base salary would be needed.<sup>9</sup>

### **Unique Challenges**

Although the Committee believes that the above proposals would provide adequate resources for all of Arizona's schools, there are several special and unique circumstances that warrant special mention:

- The rural nature of much of Arizona that suggests options for service delivery
- A renewed focus on teacher training
- Incentives for teachers for specific needs.

Arizona rurality. Much of Arizona is rural and sparse in nature. Although the bulk of students attend schools in more urban areas, a large number of students attend schools in quite isolate, rural areas. In many if not most of these cases, neither these schools nor their districts can provide the types of professional development or specialized services for special needs students. These schools often cannot recruit sufficient numbers of instructional facilitators. In many cases, such services can best be provided by some type of regional agency, including county offices of education. Thus, the Committee would urge schools in these circumstances to consider pooling some of their resources provided by the above proposals and creating or supporting some sort of

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<sup>9</sup> Districts also have options to use the funds proposed in this report for additional teacher salary incentives, such as for example, stipends for after school or summer school tutoring, as well as additional pay for extra days worked during the summer, or even extra hours during the regular contract year.

regional agency, which would organize and deliver specialized resources, including professional development to schools in sparse, rural settings.

In addition, our report mentioned above the need for a catastrophic fund for very small districts that experience unusually high costs for severely handicapped students.

Teacher training. Our state's standards-based education reform agenda and the federal No Child Left Behind Act require a "highly qualified" teacher in every classroom. But for many years, Arizona has not trained the number of teachers required to staff its schools and has relied on recruiting teachers from outside the state to provide the required numbers (Gau, Palmer, Melnick & Heffernan, 2003; Morrison Institute, 2001). As in any state, moreover, there also are many individuals who were trained to be teachers, either in Arizona or elsewhere, who could, if sufficiently enticed, teach in Arizona's schools. So there is some uncertainty as to whether current state policy allows the education system to recruit and retain a "high quality" teacher in every classroom. This issue should be closely monitored over time; if out-of-state and reserve pool recruitment cannot produce the number of needed teachers in addition to those trained in-state, then the state might need to expand its state programs of teacher training.

Teacher incentives. We have already mentioned in an earlier section of the report the need for the state to provide additional teacher fiscal incentives to address several specific teacher needs:

- Teachers in rural, sparse areas
- Teachers in high poverty-low performing schools
- Teachers in subject area shortages such as mathematics, science and technology.

Such incentives will likely be needed in both the short and long term to help all schools recruit and retain high quality teachers. Without such special incentives, the demand and supply for such teachers could become even more complicated.

### **Data-Based Decision Making**

In addition to all of the above resource issues, schools and districts will need to use the resources to engage in a series of data- and evidence-based decisions in order to successfully produce significant improvements in student learning. For that to happen, the state will need to streamline its current student, performance and fiscal data-bases.

What schools need is a data base that has:

- Student data including detailed data on student academic achievement, courses taken, and other relevant SES information, linked to
- Teachers that taught each content area for which there is an achievement score, and other data about teachers including measures of instructional practice, content actually taught, etc., linked to
- Schools with relevant school level data, including fiscal data.

Such a linked data base should be automated, should have an interface that would allow menu driven analyses at the classroom, school and district level, and the data included should be sufficient to aggregate to the district and state level for reporting purposes.

Such a data system would facilitate student-teacher value added analysis of a variety of sorts, and would allow the state to construct a value-added accountability system, if it so desired. Such analyses could be used to identify the most effective teachers and their instructional practices, which could then be included in professional development

programs. It would allow schools, districts and the state to sun set programs that had no value-added student learning impacts.

The core student tests should be tests that are aligned across grade levels so the system could show the degree to which more than annually expected achievement gains are being produced; in order to boost student performance up to desired levels, the state, districts, schools and teachers will need to produce more than annual expected student learning gains.

Such a comprehensive, core state data base could also be supplemented locally with more specific surveys of teachers' instructional practice, measures of teacher performance (such as the measures being collected in the Paradise Valley district using the Charlotte Danielson (1996) Framework for Teaching), identifiers that indicate whether students, teachers or schools are participating in specific programs, or other student, classroom/teacher, school data that the district might deem to be important for analysis.

### **3. Key Arizona Professional Judgment Panel Recommendations**

On February 4 and 5, 2004, a group of 53 leading educators met in Phoenix for a full day and a half to review and make recommendations on the modified January draft of the Steering Committee's tentative conclusions and recommendations. These individuals were divided into two "professional judgment panels." The goal of the meeting was to receive a deep and thoughtful professional review of all conclusions that had been made to date. The members of the panels, and their primary role in school districts, are indicated below; the asterisked members were part of one panel and the others were part of a second panel. Most of the panel members work in schools, and the vast majority of

those panel members were teachers. The panels included regular teachers at the elementary, middle and high school levels, as well as teachers of disabled students, English language learning students, students from lower income backgrounds and teachers of gifted students. Principals represented a variety of elementary, middle and high schools. Overall the groups were drawn from a wide array of geographical areas in the state, from urban districts to small rural districts, including one school on a Native American reservation. The goal was to obtain the professional judgments of a cross section of key individuals in schools and school districts on the work of the committee.

### **Members of the Arizona Professional Judgment Panels**

Ms.	Janet	Altersitz	Principal	Desert Sky Middle School*
Ms.	Janis (Jan)	Amator	Social Studies Teacher	Dysart High School*
Ms.	Meredith	Andrews	1st Grade Teacher	Desert Willow Elementary School
Ms.	Leticia	Barrera	1-2 Teacher	J.B. Sutton Elementary School
Mr.	Sean	Belden	Teacher (HS)	Page High School
Ms.	Debbi	Burdick	Principal	Orangewood Elementary School
Ms.	Carrie	Carlisle	Kindergarten Teacher	Sonoran Sky Elementary School
Mr.	Arthur	Carrillo	3rd Grade Teacher	Jack L. Kuban School
Ms.	Lynda	Chavez		Clarkdale-Jerome Elementary School*
Ms.	Pat	Cline	3rd Grade Teacher	Laguna Elementary School
Ms.	Eileen	Collinson	I.S.	Loma Linda Elementary School
Ms.	Garthanne	deOcampo	Preschool Teacher	Emerson Elementary School*
Mr.	Jim	Dicello	Asst. Supt. Of Business Services	Paradise Valley Unified School District Office
Ms.	Elizabeth	Duncan	Special Education Teacher	Valley View Elementary School*
Ms.	Andrea	Dunne	3rd Grade Teacher	Holmes Elementary School
Ms.	Michelle	Foster	9-12 Mathematics	Paradise Valley High School
Mr.	Joseph	Fraher	Social Studies Teacher	Highland Junior High School
Ms.	Becky	Gallegos	Director	David Kazan Family Education Center
Ms.	Pauline	Gardner	3rd Grade Teacher	Elvira Elementary School
Mr.	Anthony	Griffith	6th Grade Teacher	Cordova Middle School*
Ms.	Laura	Hesse	3rd Grade Teacher	Walter Douglas Elementary School
Mr.	Greg	Hickman		Center for the Future of Arizona*
Ms.	Debbie	Johnson	6th Grade Teacher	Holiday Park Elementary School*
Ms.	Suzanne	Kaplan	7th/8th Grade Math/ELL	Sierra Middle School
Ms.	Linda	Laneback	3rd Grade Teacher	Frank Elementary School
Ms.	Patty	Laubhan	Teacher	Lake View Elementary School*
Ms.	Julie	Letofsky	2nd Grade Teacher	Kyrene de los Lagos School*
Ms.	Lisa	Loschetter	9th Grade English/Honors	Highland High School*
Mr.	Kevin	Mendivil	Principal	Holmes Elementary School*

Mr.	Greg	Miller	Principal	Challenge Charter School*
Ms.	Anna	Montalbo	English/Spanish Teacher	Kyrene Akimel-A-al Middle School*
Ms.	Angela	Moore	Kindergarten Teacher	Mitchell Elementary School
Ms.	Maureen	Moritz	Special Ed Preschool	Madison Camelview Elementary School*
Ms.	Sharon	O'Brien	1st Grade Teacher	Echo Mountain Primary School*
Ms.	Christie	Olsen	4th Grade Teacher	Oro Grande Elementay School*
Ms.	Maggie	Post	3rd Grade Teacher	J.B. Sutton Elementary School
Ms.	Jocelyn	Raught	Spanish Teacher	Cactus Shadows High School*
Ms.	Sue	Revis	2nd Grade Teacher	Arrowhead Elementary School
Mr.	Doug	Rickard	Chemistry/Physics	Paradise Valley High School*
Ms.	Kim	Rimbey	Math Specialist	Arrowhead Elementary School*
Mr.	Tim	Rockey	10/12th World History/AP Gov't	Sunnyslope High School
Mr.	Hank	Rowe	Social Studies Teacher	Coronado K-8 School
Ms.	Bernadette	Selna	Liaison	Liaison - Yavapai County*
Ms.	Mary	Setliff	AP English	University High School*
Mr.	Peter	Smith	Teacher (HS)	Flagstaff Arts & Leadership Academy
Ms.	Kaelene	Stein	Consultant	Consultant*
Ms.	Christine	Strawser	2nd Grade Teacher	Carol G. Peck Elementary School
Mr.	Ray	Thomas	5th Grade Teacher	Cordova Middle School
Mr.	George	Thomson	Gov't/Economics Teacher	Nogales High School
Ms.	Suzy	Turrentine		Retired teacher in Prescott
Ms.	Vicki	Weideman	3rd Grade Teacher	Palm Lane Elementary School*
Dr.	Maggie	Westhoff	Staff Development Council	Washington School District*

Appendix B includes the full text of the letter Dr. Carol Peck, President of the Rodel Charitable Foundation of Arizona, sent to each panel member giving them their “charge,” and Appendix C is the agenda for the one and a half day of review. The panels met for a full day on February 4<sup>th</sup> and for half a day on February 5<sup>th</sup>. The charge to the panels was quite open-ended and asked for straightforward and unfiltered comments on the draft recommendations; the key part of that charge is the following, taken directly from the letter:

“The convening of these panels is part of a major “adequacy” study being conducted for the Rodel Charitable Foundation of Arizona by Dr. Allan Odden and Lawrence O. Picus and Associates. The purpose of the meeting is to seek your views on the type of education program needed to ensure that all Arizona students are performing at or above the proficient level on state academic standards as measured by the state’s AIMS tests.

As a member of these panels, you will be asked to review and comment on prototypical school designs that have been developed in draft form by our Steering Committee. The Steering Committee is comprised of Arizona education, community, and business leaders who have been meeting and discussing these issues for the past four months. The Steering Committee seeks your professional judgment on the work they have done so far. The end result of this work will be a proposed set of resources for three prototypical schools (elementary, middle, and high school) with estimates of what it would cost to provide the educational program designed through this process in all Arizona schools. We are including a copy of the draft report – *An Evidenced-Based Approach to School Finance Adequacy in Arizona* – that includes Steering Committee decisions through January 2004. We ask that you use this report, and specifically the resources summarized in Table 4, as the basis for your deliberations. In addition to designing these prototypical schools, each panel will be asked to share their view about how the model should be adjusted to meet the needs of schools with student population characteristics that differ substantially from the state average or diverge substantially in size from the prototype you and your panel recommend.

The panel deliberations were facilitated by Allan Odden and Lawrence O. Picus, of Lawrence O. Picus and Associates, Anabel Aportelo, an independent consultant, and Chris Canbake, an employee of Rodel; all four essentially assumed the role of “factotum” – facilitating the process but not making recommendations nor even summarizing anything other than what was in the draft report.

The evaluations completed at the end of the Panel’s deliberation showed that the panels evaluated the experience very positively, overwhelmingly believed that the Steering Committee was on the right track, and raised no major issues with any of the draft recommendations. However, the panels did suggest some recommended changes. The following summarizes those recommendations and the Committee’s responses:

- Include a recommendation for a high school program for students who need an alternative learning environment. As a conservative assumption, based on the incidence of such students in districts represented by the panels, assume 1.5

percent of high school students need such a program. Staff the program at the level of 1 professional for every 8 students.

- At its March meeting, the Steering Committee decided to accept this recommendation, but to include the cost estimate only in the body of the report, and not in the total cost figure. The Committee also noted that some schools operate ALE programs for four hours in the morning and combine then with an afternoon jobs program, and that the current funding formula provides sufficient funds for this programmatic approach. The Committee further recommended that this issue be monitored over time to determine, when comparable data on such students become available for all districts, whether a state program funded at the proposed level is adequate for high school students and whether there might also be a need for such a program at some middle schools.
- Increase the supervisory aide figure from \$35/pupil to \$140/pupil, a figure that would allow a school unit of 500 students to hire 4 full time aides paid \$18,000 in salaries and benefits, and who would be used for a variety of purposes: helping students get off buses in the morning and getting on buses in the afternoon, supervising lunch rooms and recess, and in secondary schools, providing safety and security. During other times, these individuals also could be used for LASS testing of English Language Learning students. Change the label for this category to read “supervisory aides, safety and security guards.”
  - At its March meeting, the Steering Committee decided to increase the per pupil figure from \$35/pupil to \$50/pupil, which is sufficient for a school to

have 20 hours of aid time daily for close to 175 days at a salary of about \$8 an hour. The Committee also noted that some districts are able to use funds from other sources for staff to help with getting students off and on buses and for supervision during lunch periods. This level of funding would also allow for the hiring of 1 full time security guard at a high school.

- One panel recommended dropping the 1.5 librarian position for high schools to just 1.0, and the other panel affirmed this change but also recommended adding a half time librarian position for elementary schools.
  - At its March meeting, the Steering Committee decided to accept the reduction in the high school librarian position to 1.0 but not to increase the elementary librarian allotment.
- One panel recommended extra duty funds at the rate of \$20/pupil for elementary schools, arguing that many elementary schools have a comprehensive after school set of programs, including athletic and sports programs, and need some funds to pay the non-transportation costs of field trips.
  - At its March meeting, the Steering Committee decided not to adopt this recommendation.
- Delete the language on higher salaries for teachers in shortage areas, like mathematics and science teachers; signing bonuses would be better.
  - At its March meeting, the Steering Committee decided to retain the original proposal to provide salary incentives, including permanent salary increases, for teachers in shortage areas such as mathematics and science.

Again referring to the Governor Hull Task Force, which thoroughly analyzed this issue, the Committee concluded that some teachers simply operate in a different labor market, and that the major way to address this reality is to provide a higher salary to those teachers, which today tend largely to be mathematics and science teachers.

The panels also recommended language changes in several parts of the report. The major suggestions are as follows and nearly all have been incorporated into the body of the report:

- The groups felt that the average teacher work year was closer to 186 days than 190, but agreed that whatever it was, it included 4 professional development days, so the recommendation is for an additional 6 professional development days, to bring the total to 10.
- For school size, add a phrase that choice of secondary schools of various sizes – small, SWAS, charter, comprehensive, etc. – may not in fact exist in sparse, rural areas, and in lower income areas, parents often do not have the time or resources to avail themselves of choice were it to be provided.
  - Also say SWAS is not the only way to “break up” large schools to create a more personalized and community environment, and that teaming and other strategies also could be used.
- Since the class size recommendations are for average class sizes, add language that would cap actual class sizes at 20 for grades K-5, and 30 for grades 4-12. Several teachers and principals indicated that, for many reasons, some classes can be quite large even though averages are relatively small. The “cap”

figures are those that the teachers felt was the “breaking point” for the recommended average to begin not working.

- Also, referencing California, suggest that smaller class sizes in K-3 should be phased-in so neither districts nor schools are faced with the dilemma of an elementary teacher shortage and the need to staff smaller classes with unqualified teachers.
- Also note that block schedules would allow teachers of English and writing to give more writing assignments and have the time to provide detailed feedback to students, which is needed to help students write better, but is very time consuming with large numbers of students.
- For the planning and preparation time periods for teachers that would be used for collaborative work on curriculum and instruction, add a phrase that the time allotted should be uninterrupted, not 30 minutes at some point in the day and another 25 minutes at another time.
- Change the language in the report on low and moderate disabilities, and catastrophic, simply to Group A and Group B, which is the Arizona language actually uses.
  - Alter than language on the incidence of disabled students in Charter schools to say on average the incidence is lower, but that some Charter schools – the one represented in the panel – have high incidence rates – 28% in the panel school.

- Add a sentence saying that principals should seek to have an equal incidence of Group A students in all classes, i.e., not have some classes with a high incidence and others with a low incidence.
- Add stronger language that services need to be provided to gifted, talented, able and ambitious students, as often services are not provided.
- In the text, say that at least one of the positions in the pupil support category should be a nurse.
  - The Committee did not accept this suggestion.

As should be clear, these are all quite helpful suggestions, and also reflect Panel satisfaction with the bulk of the report.

## **4. Proposed Resources for Prototypical Arizona Elementary, Middle and High Schools**

Given the conclusions reflected in Section 2, input from other Arizona education leaders, the Arizona Professional Judgment Panel recommendations accepted in Section 3, and proposals from the professional judgment panels in other states accepted in Appendix A, the Committee's draft recommendations are included in Table 1.

As described above, the numbers would be proportionately prorated up and down to the actual enrollments of each Arizona school, with the minimums for small schools described below. Further, the resources shown in Table 1 would enable schools to deploy any of the more than a dozen comprehensive school reform strategies currently in use (Odden, 2000; Erlichson & Goertz, 2001; Erlichson, Goertz & Turnbull, 1999).

**Table 1**  
**Recommendations for Adequate Resources for**  
**Prototypical Arizona Elementary, Middle and High Schools**

<b>School Element</b>	<b>Elementary Schools</b>	<b>Middle Schools</b>	<b>High Schools</b>
<b>School Characteristics</b>			
School configuration	K-5	6-8	9-12
Prototypic school size	500	500	500
Class size	K-3: 15 4-5: 25	6-8: 25	9-12: 25
Full-day kindergarten	Yes	NA	NA
Number of teacher work days	192 teacher work days, so an increase of 6 days.	192 teacher work days, so an increase of 6 days.	192 teacher work days, so an increase of 6 days.
% Disabled	12 %	12 %	12 %
% Poverty (free & reduced lunch)	50 %	50 %	50 %
% ELL	25 %	25 %	25 %
% Minority	49 %	49 %	49 %
<b>Personnel Resources</b>			
Principal	1	1	1
Instructional Facilitators/Mentors	2.5	2.5	2.5
Teachers	29	20	20
Specialist teachers	20% more: 6	20% more: 4	33% more: 6.7
Instructional aides	0	0	0
Teachers for struggling students	1/each 20% poverty or one for every 100 poverty students: 2.5	1/each 20% poverty or one for every 100 poverty students: 2.5	1/each 20% poverty or one for every 100 poverty students: 2.5
Teachers for ELL students	An additional 0.4 teachers for every 100 ELL/LEP students who are also from a poverty family 1.0	An additional 0.4 teachers for every 100 ELL/LEP students who are also from a poverty family 1.0	An additional 0.4 teachers for every 100 ELL/LEP students who are also from a poverty family 1.0

**Table 1 (Continued)**  
**Recommendations for Adequate Resources for**  
**Prototypical Arizona Elementary, Middle and High Schools**

<b>School Element</b>	<b>Elementary Schools</b>	<b>Middle Schools</b>	<b>High Schools</b>
School Characteristics			
Alternative Learning Environment	No common data for making recommendations	No common data for making recommendations	No common data for making recommendations
Teachers for Group A disabled students	Extra weight of 0.16 for all students	Extra weight of 0.16 for all students	Extra weight of 0.16 for all students
Group B disabled students	Retain current state weights for Category B special needs students.	Retain current state weights for Category B special needs students.	Retain current state weights for Category B special needs students.
Teachers for gifted students	Appropriate services required; resources include in Category A pupil weights.	Appropriate services required; resources include in Category A pupil weights.	Appropriate services required; resources include in Category A pupil weights.
Pupil support staff	1/each 20% poverty, or 1 for every 100 poverty students: 2.5	1 for every 100 poverty students plus 1.0 guidance 3.5 total	1 for every 100 poverty students plus 2.0 guidance 4.5 total
Librarians/ media specialists	0; included with specialist teachers	1.0	1.0
Technology resource teachers	Included in Instructional Facilitators	Included in Instructional Facilitators	Included in Instructional Facilitators
Substitutes	10 days per teacher	10 days per teacher	10 days per teacher
<b>Dollar per Pupil Resources</b>			
Professional development	Included above: Instructional facilitators Planning & prep time 10 summer days Additional: \$50/pupil for other PD expenses – trainers, conferences, travel, etc.	Included above: Instructional facilitators Planning & prep time 10 summer days Additional: \$50/pupil for other PD expenses – trainers, conferences, travel, etc.	Included above: Instructional facilitators Planning & prep time 10 summer days Additional: \$50/pupil for other PD expenses – trainers, conferences, travel, etc.

**Table 1 (Continued)**  
**Recommendations for Adequate Resources for**  
**Prototypical Arizona Elementary, Middle and High Schools**

<b>School Element</b>	<b>Elementary Schools</b>	<b>Middle Schools</b>	<b>High Schools</b>
School Characteristics			
Technology	\$250/pupil	\$250/pupil	\$250/pupil
Instructional materials, equipment, student activities, including textbooks	\$250/pupil	\$250/pupil	\$250/pupil
Extra duty funds	NA	\$60/pupil	\$120/pupil
Funds for Supervisory Aides (lunch, playground, buses)	\$50/pupil	\$50/pupil	\$50/pupil

**Minimums and maximums:** For school units with more than 500 students, all resources are prorated up by the number of students. For school units with less than 500 students, all resources are prorated down, except:

- Every school has a full time principal
- Schools with fewer than 200 students are provided at least one instructional facilitator, one tutor and one pupil support position.

**Teacher Salaries:** Initially, use the state average and then estimate the cost of going to the national average. Estimate the cost of incentives for teachers in sparse, rural areas, for teachers in high poverty-low performing schools, and for teachers who teach in subject area shortages such as mathematics, science and technology.

## 5. Costs and Funding

The following section briefly describes how Lawrence O. Picus and Associates calculated the additional costs of an adequate Arizona school funding system.

1. In 2002-2003, Arizona districts and charter schools spent \$6.1 billion (excluding spending for capital facilities and debt) on operating expenditures for all aspects of schools. Excluding federal funds, special revenue funds, and districts not included in the analysis, expenditures total \$5.0 billion. And, after modifications to central office staff and tuition payments, we utilize current operating expenditures of \$5.1 billion, or \$5,500 per-pupil,<sup>10</sup> for this analysis (This figure would have been \$5745 if it had included full-day kindergarten, which the state has now committed to fund).
2. Of this later total, \$3.6 billion was spent for what we call “core instructional services,” or those services relating to instruction, student and instructional support, and school administration. The expenditures for these core instructional services were supplanted by those of the adequacy model. This number would have been about \$3.8 billion if it had, as the state has now committed to do, included full day kindergarten for all students.

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<sup>10</sup> The current Arizona per-pupil expenditures from which Lawrence O. Picus & Associates completed analysis differs from a National Education Association (NEA) report showing 2002-03 per-pupil expenditures of \$5,200, using expenditures of \$4.9 billion and enrollment of 940,000 students to complete this calculation. The consultants differ from this calculation by reporting 2002-03 per-pupil expenditures of \$5,500, using expenditures of \$5.1 billion and ADM of 928,000 to complete this calculation. The difference in per-pupil expenditures stems from the data used for expenditures and student counts.

The NEA Arizona state expenditure data apparently excludes expenditures from all capital and debt funds. Lawrence O. Picus & Associates chose to include \$345 million from the soft capital and unrestricted capital funds because, according to the state's chart of accounts, a portion of these funds are used to purchase instructional materials, equipment, and technology. Because these items form a component of the adequacy matrix, the consultants included classroom related expenditures from these funds to be assured of capturing current expenditures in these areas. The consultants attempted to limit expenditures from these funds to classroom instruction related items by including spending only from the functions most likely to support classroom instruction: function 1000—Instruction and function 2100—Student Support Services.

NEA pupil count data differs from the consultants' for several reasons. First, the NEA uses enrollment in its calculation while the consultants use ADM. Second, the consultants performed modifications on the ADM, as follows: 1) AZ supplied (12/18/03) ADM counts to the consultants equaling 908,000 students, 2) The consultants' analysis excludes 15,000 students in 215 schools because they are outside the purview of the adequacy model, including accommodation districts, correctional facilities, joint technological and education districts, private schools, and non state entities, some of which are funded primarily outside the local/state sharing system, 3) The consultants exclude pre-K students, which account for 3,000 ADM, 4) Because the adequacy model calls for all students to attend full day kindergarten programs, the consultants' kindergarten ADM count is adjusted so that all kindergarten students are counted as full time students, which increases ADM by 37,000 students. This adjusted count is used in determining both current and proposed per pupil expenditures.

3. The remaining \$1.5 billion in current expenditures represent school services carried over by the model. These include central office administration, pupil transportation, food service, and other non-instructional services as well as adjustments for school central office staffing and tuition payments.
4. To provide for an adequate education program, Arizona would need to increase current expenditures from the 2002-2003 average of \$5,745 (including an estimated additional amount for full day kindergarten) to \$7,175, or an increase of about \$1,430 per pupil, but still below the national average.
5. Total resources for core instructional services using the evidenced-based approach to determining adequacy would require expenditures of \$5.2 billion, or an increase of \$1.3 billion.

Several assumptions are built into the cost methodology of this study:

1. The six additional days for the teacher contract, to be used for professional development, are calculated for all certified staff other than the principal. The cost of this professional development is calculated at a rate of \$225.80 per day, which includes \$200 in salary and \$25.80 in non-health benefits.
2. 215 schools, representing 14,599 (1.7%) students, were not included in this analysis. These 215 schools were excluded, for the most part, because they were outside the purview of our model, including accommodation districts, correctional facilities, joint technological and education districts, private schools, and non-state entities, some of which are funded primarily outside the local/state sharing system.
3. 20 districts, for which we had data sufficient to determine model costs and for which we did not have current expenditure data, were included in the model calculations. The current expenditures for these schools were estimated using the average per-pupil expenditure in Arizona to determine the likely difference between adequacy model expenditures and current expenditures.
4. Additionally, current revenue data for four charter schools were not included in the state's Annual Financial Report (AFR), so current revenues are understated by several million dollars.
5. The ten substitute days are calculated for only regular classroom teachers and the specialist teachers (art, music, physical education, etc.), not for every professional staff member in the school.
6. Table 2 shows the estimated average salaries used for calculating school and district personnel costs:

**Table 2**  
**Statewide Average Salaries and Fringe Benefits**  
**Used in Calculating Staff Costs**

<b>Position</b>	<b>Salary</b>	<b>Fringe</b>	<b>Total Comp.</b>
Assist. Supt. Of C&I	\$82,350	16.9%	\$ 96,267
SPED Coordinator	\$82,350	16.9%	\$ 96,267
Program Coordinator	\$82,350	16.9%	\$ 96,267
School Psychologist	\$40,900	21.1%	\$ 49,530
Secretary/Clerical	\$18,000	31.5%	\$ 23,670
Technology Network	\$40,900	21.1%	\$ 49,530
Evaluator	\$71,100	17.6%	\$ 83,614
Principal	\$71,100	17.6%	\$ 83,614
Teacher	\$40,900	21.1%	\$ 49,530
Instructional Aide	\$11,000	43.4%	\$ 15,774
Schl Exec Secretary	\$18,000	31.5%	\$ 23,670
School Clerk	\$14,000	36.8%	\$ 19,152
Sub Cost (Daily)	\$ 80	12.9%	\$ 90

To determine the difference between current Arizona school district expenditures and those required to meet the cost of the adequacy model, expenditures in certain funds which make up the bulk of core instructional services were isolated for replacement by the adequacy model, while other special-use funds were carried over unchanged or excluded from our analysis. We included the following expenditure funds in the analysis, as they are inclusive of the programs the evidence-based adequacy model covers:

- M&O 001
- Classroom site fund 010 (which is used primarily for teacher salary increases and class size)
- Unrestricted capital 610 (used primarily for books, educational technology, some facility items, and emergency funds)
- Soft capital 625 (used primarily for short term capital items like instructional materials and technology).

Within these funds, the functions comprising the core instructional services replaced by the adequacy model included:

- 1000 Instruction

- 2100 Student Support
- 2200 Instructional Staff Support
- 2400 School Administration

The expenditures within these functions, for the districts and charter schools included in the analysis, totaled \$3.6 billion.

The functions comprising the current expenditures carried forward, used primarily to support services for central office administration, transportation, capital, and debt, included, for the same funds as listed above:

- 2300 General Administration
- 2500 Business Services
- 2600 Plant Operation and Maintenance
- 2700 Student Transportation
- 2800 Central Support Services
- 2900 Other Support Services
- 3000 Noninstructional Services
- 4000 Facilities Acquisition and Construction
- 5000 Debt Service

We excluded from our analysis the following funds:

- Federal Funds 100-399
- Federal Indirect Costs 570
- State Projects 400-499
- Other Special Revenue Funds 500-595
- Capital Funds 620-695
- Debt Service 700-799
- Fiduciary Funds 800-899
- Proprietary Funds 900-999.

The cost of the adequacy model plus the cost of the expenditure areas carried forward unchanged was then compared to the corresponding actual expenditures to determine the additional cost of the model. Since the state has recently made a commitment to fund full-day kindergarten, we have included these costs in the model, and the additional costs exclude the costs for full-day kindergarten.

Instruction-related expenditures for the Unrestricted Capital Outlay 610 and Soft Capital Allocation 625 were included among the current expenditure areas replaced by the model because a significant portion of these capital funds were used for purchasing instructional materials, equipment and technology, all costs that are included in the adequacy model matrix.

Table 3 summarizes the resulting figures. We began with a total of \$6,116 million in M & O expenditures. We then deducted expenditures from federal and other excluded funds, ending with an M & O total of \$4,961 million for our analysis. Of that total, we have \$3,610 million in expenditures (\$3.8 billion including the new full day kindergarten commitment) that are replaced by our adequacy school models, and after some modifications, we have a carry forward amount of \$1,506 million.

The new adequacy model costs \$5,022 million, which when added to the carry forward and severe disabilities costs, equals a new total of \$6,658 million, or a total increase of \$1,325 million over current spending (plus the costs of full day kindergarten), as the costs of the adequacy proposals over and above what the state now spends or has committed to spend, with teacher salaries priced at the current Arizona state average.

As noted above, the costs of raising teacher salaries to the national average, but through a strengthened performance-based structure, would require an additional \$450 million.

A total of \$62.2 million in other state and local revenues were not used as an offset to the costs of the adequacy model. These include county school funds; investment earnings; and other miscellaneous state, local and intermediate revenues in funds 001, 610 and 625. We excluded these sources of revenue because they may be, for the most

part, earmarked for specific purposes not related to the functions addressed by the adequacy model. Without more information about the specific purposes to which these revenues were applied, we chose to exclude them from this analysis.

**Table 3**  
**Comparison of Current Expenditures and**  
**The Costs of the Proposed Adequacy Model**

Description	Cost (in millions of dollars)	Cost Per Pupil
Total Current Operating Expenditures from AFR (excluding capital facilities and debt service)	\$6,116	
Federal Funds	\$502	
Other Excluded Funds	\$573	
Districts/Charters Excluded from Analysis	\$79	
Net Current District/Charter Operating Expenditures	\$4,961	
Central office staff and tuition adjustment	\$155	
<b>Current Expenses</b>	<b>\$5,119</b>	<b>\$5,516</b>
<b>Current Expenses + Full Day Kindergarten</b>	<b>\$5,332</b>	<b>\$5,745</b>
<b>Functions Replaced by Adequacy Model</b>	<b>\$3,614</b>	<b>\$3,894</b>
<b>Functions Replaced by Adequacy Model + costs of full day Kindergarten: A</b>	<b>\$3,827</b>	<b>\$4,124</b>
Cost of Functions Carried Forward	\$1,350	
Central office staff adjustment	\$166	
Tuition payment adjustment	(\$11)	
<b>Net Adjusted carry forward: B</b>	<b>\$1,506</b>	<b>\$1,623</b>
<b>Current Expenses + Full Day Kindergarten: Functions Replaced by Adequacy Model + Net Adjusted Carry Forward (A + B)</b>	<b>\$5,332</b>	<b>\$5,745</b>
<b>Adequacy Costs Over Current Expenditures</b>		
Adequacy Model Matrix Costs	\$5,022	\$ 5,412
Severe disability program costs	\$130	
Total Adequacy Model Costs	\$5,152	\$5,552
Carry forward:	\$1,506	\$1,623
<b>New Current Expenses – C</b>	<b>\$6,658</b>	<b>\$7,175</b>
<b>Increase In Adequacy Model Costs Over Modified Current Expenditures [C – (A + B)]</b>	<b>\$1,325</b>	<b>\$ 1,428</b>

Table 4 indicates the costs, in both total and per pupil terms, of the major elements of the proposed adequacy model. We list the items as they appear in Table 1, so no order of importance is intended. And we speak to implementation phasing in the next section, so no implications should be drawn from the table concerning which element might be phased- in before which other element.

**Table 4  
Costs of Major Elements in the Adequacy Model**

<b>Adequacy Element</b>	<b>Total Cost (millions)</b>	<b>Total Cost Per Pupil</b>
Class size reduction in K-3 to 15 students	\$ 496 million	\$ 534/pupil
Class sizes in grades 4-12 of 25 rather than 30	\$ 271 million	\$ 292/pupil
Instructional facilitators	\$ 242 million	\$ 261/pupil
Tutors (but leaving a minimum of 1 tutor in each school of 500 students)	\$ 99 million	\$ 107/pupil
Professional Development Trainers	\$ 46 million	\$ 50/pupil
Technology	\$ 232 million	\$ 250/pupil

### **Desegregation Funding**

Many individuals might raise the issue of desegregation funding in the event that the state provided adequate school funding. However, desegregation issues and related funding requirements are concerns among the federal government, the U.S. Office of Civil Rights, the courts, and local school districts and do not involve the state directly. Desegregation funding is the result of desegregation agreements among these various parties. Thus, our estimate of the costs of providing the above adequate resources

excludes as a funding source current desegregation resources. It could be that over time, if the state actually provided adequate school funding, then desegregation cost requirements could be reduced but this could only be accomplished if the above parties agreed and would likely occur on a case-by-case basis.

## **7. Conclusion**

As Arizona policy makers know very well, school finance issues and structures are changing, largely in response to the more rigorous demands of state education systems and adequacy-oriented school finance court mandates. Today, a new Arizona school finance system must provide districts and sites with adequate education dollars so education leaders can deploy resources to more powerful education strategies that produce higher levels of student academic performance. In general terms, the key role for the state is to determine an adequate level of education spending for each of its school districts. Districts must then allocate these dollars to schools via a needs-based per-pupil formula that ensures that each school has adequate dollars for the needs of each of its students. Schools need to use these adequate resources for the most effective education strategies, which generally will require substantial program restructuring and resource reallocation. Then, each school should be held accountable for educating students to the state's student performance standards and for using its adequate resource levels in effective and efficient ways.

Again, as stated several times above, one cannot overstate the importance of the need for schools to transform the above adequate resources into powerful and effective instructional strategies that boost student achievement. As Cohen, Raudenbush and Ball (2002) so eloquently argue, school resources are "inert" unless and until they are

transformed into high quality instructional practices. So for the above resources to have more than just marginal impacts on student learning, schools need to use the dollars to purchase and implement effective curriculum programs in all content areas, principals need to organize schools so they have the instructional leadership research shows is so important (Hallinger & Heck, 1996, 1998), this leadership should help teachers create a professional school culture that focuses on continuously improving the instructional program and take responsibility for the impacts of their instruction practice (Louis, Kruse & Marks, 1996; Louis, Marks & Kruse, 1996; Louis & Marks, 1998; Newmann, 1996), and an intensive and effective professional development program needs to operate in ways to continually improve the instructional program. The above resources are necessary for these actions to take place. But the above adequate resources plus the professional and performance pay program recommended for teachers and these leadership actions include the necessary and sufficient conditions for having schools teach Arizona students to its rigorous performance standards.

The proposed adequacy model calls for increased spending of \$ 1,325 million to be fully funded. We do not expect the legislature to provide this funding increase at one time. Clearly, there will need to be a phase-in period. The first challenge will be for schools to use the \$3.6 billion currently in the system to begin implementing, via restructuring and resource reallocation, the most salient features of the adequacy model. The next priority should be, as per the new state commitment, full day kindergarten, which is being phased-in by funding the all day program in the highest poverty schools first. Third, extra funds should finance all the professional development resources, particularly the instructional coaches in all schools; this recommendation follows from

the assumption that improved instruction is the key to improved student learning. Thus, the full new approach to professional development, including the coaching needed in each individual teacher's classroom, needs a high priority during the phase-in period. The K-3 class size reduction should be phased-in over at least five years, beginning in kindergarten, to insure that sufficient, high quality teachers are available to staff these classes. The highest poverty schools also could be the first to receive the dollars to reduce their class sizes for these grades. Funds to equip all schools with sufficient technology should be provided only when the professional development infrastructure is fully operational so that there is sufficient training to incorporate the technology into both instructional and management practices in classrooms, schools and districts.

Finally, we suggest that this is not a time to squeeze the leadership and technical assistance resources of the Arizona Department of Education. Indeed, the aspirations of Arizonans for an improved education system will require some sort of centralized leadership provided by the Department, and supported by superintendents, principals, teachers, school boards and the business community. Indeed, we recommend that the legislature increase department funding, by at least \$3 million so it can:

- Continue and expand its Solutions Teams that redesign low performing schools
- Create summer institutes to train teachers in subject matter content and how to develop or hone standards-based curriculum units, and to train the school-based instructional coaches
- Help districts create solid new teacher induction and mentoring programs

- Train superintendents and principals in how to help schools engage in the curriculum redesign, restructuring and resource allocation tasks necessary to accomplish the goals embodied in this report
- Continue its work with school districts on curriculum alignment and coherence
- Work diligently on the monitoring, reporting and accountability responsibilities embodied in Proposition 301, Arizona LEARNS and NCLB.

Our final comment is this. The Arizona education community, with the support of the business community, is willing to take on the challenge of teaching all Arizona's students to the proficiency standards the state has developed. It also is willing to be held accountable for continuous improvement towards moving student achievement up to these standards, as well as the national NAEP standards. But this challenge not only takes willingness, effort and intelligence, it also takes adequate resources. And that is a state responsibility. So the state not only needs to develop curriculum and student performance standards, and an accountability system to measure results and identify progress, but also it needs to provide adequate resources that allow educators to get this important job done.

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## Appendix A

### Other State Professional Judgment Panel Recommendations

In this appendix, we compare the staffing and resources proposed above with similar prototypical school proposals that emerged from several recent professional judgment approaches to determining adequacy in several states around the country. We have selected five other studies, one recently completed by Picus, Odden and Fermanich (2003) for the state of Kentucky, and four completed by the firm of Augenblick and Meyers during the past 3 years for Kansas, Nebraska, Montana, and Maryland (Alexander, Augenblick, Driscoll, Guthrie & Levin, 1995; Augenblick, 1997, 2001; Augenblick, Myers, Silverstein & Barkis, 2002; Meyers & Silverstein, 2002). Tables 1, 2 and 3 display the characteristics for each of prototypical elementary, middle and high schools.

There are several differences and similarities between the proposed Arizona adequate resources in Table 1 and the professional judgment studies. The following summarizes these points:

- All models have a principal.
- The proposed Arizona models have instructional facilitators rather than assistant principals.
- The professional judgment models have smaller class sizes; the proposed Arizona models have class sizes of 15 for only K-3, and the report argues that there is no good evidence supporting class sizes of 22, 20 or lower at the secondary levels.
- The Arizona model proposes 20 percent more teachers for specialist subjects, while the other models often provide more than that amount, although the Arizona

model does propose 33 percent more for high schools to allow for block scheduling.

- The Arizona model proposes a more parsimonious but still adequate level of resources for struggling, disabled and ELL students, while the professional judgment panels propose a higher level of special education teachers.
- The Arizona model proposes pupil support resources that vary with poverty, while the other models generally do not.
- The Arizona model has a more integrated and comprehensive professional development strategy, which is key to transforming all resources into improved instructional strategies that are the key to producing higher levels of student achievement.
- The professional judgment models include specific library staff resources for middle and high schools, which in part led to the librarian proposals in the Arizona model.
- The Arizona model is more skeptical about instructional aides, and would only propose, if any, specially selected and trained tutoring aides while most professional judgment panels include an assortment of instructional aides.
- The professional judgment panels that recommended about 10 days per teacher of substitute resources are about right; a small survey found about that level in Kentucky. The proposed Arizona model has this recommendation.
- All models essentially agree that the computer technologies require an annual expenditure of about \$250/pupil.

- The professional judgment models suggest various levels of dollars per pupil for instructional materials, equipment, supplies and student activities, including athletics in secondary schools. The proposed Arizona model recommends a figure of \$250 per pupil as an adequate number.

**Table A1**  
**Summary of Resources for Prototypic Elementary**  
**Schools from Professional Judgment Panels in Several States**

<b>School Element</b>	<b>Kentucky, Picus &amp; Odden</b>	<b>Kansas, Augenblick &amp; Meyers</b>	<b>Nebraska, Augenblick &amp; Meyers</b>	<b>Montana, Augenblick &amp; Meyers</b>	<b>Maryland, Augenblick &amp; Meyers</b>
School configuration	K-5	K-5	K-6	K-5	K-5
School size	400	430	350	360	500
Class size	~20	~20	~17.5	~21	~15
Full day kindergarten	Yes	Yes	Yes	Yes	Yes
Length of teacher work year	200 days				
% Disabled	10 % moderate	14 %	13 %	12 %	13.5%
% Poverty (free & reduced lunch)	50 %	36 %	32 %	24%	31 %
% ELL	~ 4 %	4 %	5 %	5 %	3 %
% Minority	--	---	---	5 % Native American	46 %
Principal	1	1	1	1	1
Assistant Principal	0	0	0	0	1
Instructional Facilitators/Mentors	1	0	0	0	1
Teachers	24	22	20	17	33
Specialist teachers	~5	4.4	2	3	6
Instructional aides	8	1	0	3.5	15
Teachers for struggling students	1/each 25% poverty: 2	4	1	0	0
Teachers for students with disabilities	5	6	3.5	3.2	5.5

**Table A1 (Continued)**  
**Summary of Resources for Prototypic Elementary**  
**Schools from Professional Judgment Panels in Several States**

<b>School Element</b>	<b>Kentucky, Picus &amp; Odden</b>	<b>Kansas, Augenblick &amp; Meyer</b>	<b>Nebraska, Augenblick &amp; Meyer</b>	<b>Montana, Augenblick &amp; Meyer</b>	<b>Maryland, Augenblick &amp; Meyer</b>
Teachers for ELL students	1	1	1	Extra 24 % for each Native American student	0
Teachers for gifted students	0	0	0	0	0
Aides for categorical students		10	6	4	6
Pupil support staff	3	3	2.1	1.6	7
Librarians/media specialists	Included in specialists	1	1	1	1.5
Technology resource teachers	1	1	0.5	1	2
Substitutes	1 permanent plus additional funds for typical use	2 permanent	10 days for each professional staff	\$19,800	3 permanent
Professional development	10 summer days included in 200 day year, plus \$500/teacher	5 days plus \$500/teacher	5 days plus \$200/teacher	8 days	10 days
Technology	\$265/pupil	\$250/pupil	\$250/pupil	\$275/pupil	\$160/pupil
Instructional materials, equipment, student activities	\$250/pupil	\$270/pupil	\$90/pupil	\$300/pupil	\$205/pupil
Teacher salary levels	National Average	State average	State average	State average + 4.4 % to comparative state average	State average + 1.6 % to comparative state average

**Table A2**  
**Summary of Resources for Prototypical Middle**  
**Schools from Professional Judgment Panels in Several States**

<b>School Element</b>	<b>Kentucky, Picus &amp; Odden</b>	<b>Kansas, Augenblick &amp; Meyer</b>	<b>Nebraska, Augenblick &amp; Meyer</b>	<b>Montana, Augenblick &amp; Meyer</b>	<b>Maryland, Augenblick &amp; Meyer</b>
School configuration	6-8	6-8	7-8	6-8	6-8
School size	500	430	680	630	800
Class size	20	~22	~20	~25	~22
Length of teacher work year	200				
% Disabled	10 %	14 %	13 %	12 %	13.5%
% Poverty (free & reduced lunch)	50 %	36 %	32 %	24%	31 %
% ELL	~4 %	4 %	5 %	5 %	3 %
% Minority		---	---	5 % Native American	46 %
Principal	1	1	1	1	1
Assistant Principal	0	1	1	1.5	3
Instructional Facilitators/ Mentors	1	0	0	0	0
Teachers	25	19.5	24	25	36
Specialist teachers	20 % more: 5	6.5	20	10	9
Instructional aides		1	0	6	10
Teachers for struggling students		4	3	0	0

**Table A2 (Continued)**  
**Summary of Resources for Prototypical Middle**  
**Schools from Professional Judgment Panels in Several States**

<b>School Element</b>	<b>Kentucky, Picus &amp; Odden</b>	<b>Kansas, Augenblick &amp; Meyer</b>	<b>Nebraska, Augenblick &amp; Meyer</b>	<b>Montana, Augenblick &amp; Meyer</b>	<b>Maryland, Augenblick &amp; Meyer</b>
Teachers for students with disabilities	7, plus 1 more if % poverty > 75%	7	5	6.25	7
Teachers for ELL students	1	1	2	Extra 24 % for each Native American student	0
Teachers for gifted students	0	0	0	0	0
Aides for categorical students	0	13	8	7	6
Pupil support staff	4.5	3.8	4.8	3.2	10
Librarians/media specialists	1	1.5	1	1.5	2
Technology resource teachers	1	1	1	1.5	2
Substitutes	1 permanent Plus dollars for more	3 permanent	10 days for each professional staff	\$34,650	3 permanent
Professional development	10 summer days included in 200 day year, plus \$500/teacher	5 days + \$500/teacher	5 days + \$200/teacher	8 days	10 days
Technology	\$265/pupil	\$250/pupil	\$250/pupil	\$275/pupil	\$137/pupil
Instructional materials, equipment, student activities	\$250/pupil + \$60/pupil for extra duties for teachers	\$465/pupil	\$190/pupil	\$600/pupil	\$305/pupil
Teacher salary levels	National Average	State average	State average	State average + 4.4 % to comparative state average	State average + 1.6 % to comparative state average

**Table A3**  
**Summary of Resources for Prototypical High**  
**Schools from Professional Judgment Panels in Several States**

<b>School Element</b>	<b>Kentucky, Picus &amp; Odden</b>	<b>Kansas, Augenblick &amp; Meyer</b>	<b>Nebraska, Augenblick &amp; Meyer</b>	<b>Montana, Augenblick &amp; Meyer</b>	<b>Maryland, Augenblick &amp; Meyer</b>
School configuration	9-12	9-12	9-12	9-12	9-12
School size	800	1150	1900	1300	1000
Class size	20	~23	~19	~20	~17
Length of teacher work year	200 days, including 10 summer PD days				
% Disabled	10 %	14 %	13 %	12 %	13.5%
% Poverty (free & reduced lunch)	50 %	36 %	32 %	24%	31 %
% ELL	~4 %	4 %	5 %	5 %	3 %
% Minority	--	---	---	5 % Native American	46 %
Principal	1	1	1	1	1
Assistant Principal	1	3	6.5	3	5
Instructional Facilitators/ Mentors	2	0	0	0	0
Teachers	40	49.5	120	81	69
Specialist teachers	20% more: 8	14.5	--	--	--
Instructional aides		2	--	6.5	4
Teachers for struggling students	8	10	8	0	0

**Table A3 (Continued)**  
**Summary of Resources for Prototypical High**  
**Schools from Professional Judgment Panels in Several States**

School Element	Kentucky, Picus & Odden	Kansas, Augenblick & Meyers	Nebraska, Augenblick & Meyers	Montana, Augenblick & Meyers	Maryland, Augenblick & Meyers
Teachers for students with disabilities		15	14	12	8
Teachers for ELL students	2	2	5	Extra 24 % for each Native American student	0
Teachers for gifted students	0	0	0	0	0
Aides for categorical students	--	24	13	14	7
Pupil support staff	8	7	11	7	8
Librarians/ media specialists	2	2	2	2	2
Technology resource teachers	2	1	1	2	2
Substitutes	2 permanent + typical use for illness and PD	9 permanent	10 days for each professional staff	\$80,000	6 permanent
Professional development	10 summer days included in 200 day year, plus \$500/teacher	5 days + \$500/teacher	5 days + \$200/teacher	8 days	10 days
Technology	\$264/pupil	\$250/pupil	\$250/pupil	\$275/pupil	\$162/pupil
Instructional materials, equipment, student activities	\$150/pupil plus \$120/pupil for extra duties for teachers	\$635/pupil	\$530/pupil	\$900/pupil	\$850/pupil
Teacher salary levels	National Average	State average	State average	State average + 4.4 % to comparative state average	State average + 1.6 % to comparative state average

**Appendix B**  
**Letter to Professional Judgment Panel Members**

January 22, 2004

Dear Professional Judgment Panel Participants:

Thank you for agreeing to participate on our Professional Judgment Panels at the **Bank One Building, 201 N. Central Avenue, 12th floor Conference Rooms 1 and 2**. The meetings will held on Wednesday, February 4th, from 9:00 AM – 4:30 PM and Thursday, February 5<sup>th</sup>, from 8:30 AM – 12:00 Noon. Parking Instructions: The entrance to the Bank One Parking Garage is off First Street and Monroe. Parking is available on all levels, just make note of which level you park on, i.e., yellow, orange, blue, gray, etc. Take the elevator to the “tunnel” level to get to the Bank One Building. Please bring your parking ticket to the meeting for validation.

The convening of these panels is part of a major “adequacy” study being conducted for the Rodel Charitable Foundation of Arizona by Dr. Allan Odden and Lawrence O. Picus and Associates. The purpose of the meeting is to seek your views on the type of education program needed to ensure that all Arizona students are performing at or above the proficient level on state academic standards as measured by the state’s AIMS tests.

As a member of these panels, you will be asked to review and comment on prototypical school designs that have been developed in draft form by our Steering Committee. The Steering Committee is comprised of Arizona education, community, and business leaders who have been meeting and discussing these issues for the past four months. The Steering Committee seeks your professional judgment on the work they have done so far. The end result of this work will be a proposed set of resources for three prototypical schools (elementary, middle, and high school) with estimates of what it would cost to provide the educational program designed through this process in all Arizona schools. We are including a copy of the draft report – *An Evidenced-Based Approach to School Finance Adequacy in Arizona* – that includes Steering Committee decisions through January 2004. We ask that you use this report, and specifically the resources summarized in Table 4, as the basis for your deliberations. In addition to designing these prototypical schools, each panel will be asked to share their view about how the model should be adjusted to meet the needs of schools with student population characteristics that differ substantially from the state average or diverge substantially in size from the prototype you and your panel recommend.

The Steering Committee will discuss your comments and suggestions at a meeting in March. Input from the Professional Judgment Panels will be given serious consideration as the Steering Committee develops and publishes its final report later this year.

I appreciate your willingness to help with this important endeavor.

Sincerely,

Dr. Carol G. Peck  
President and CEO

CGP:bw  
Enclosures

**Appendix C**  
**Professional Judgment Panels AGENDA**  
**FEBRUARY 4-5, 2004**

Bank One Building  
201 N. Central Avenue  
12<sup>th</sup> Floor Conference Rooms 1 & 2  
Phoenix, Arizona

**WEDNESDAY, FEBRUARY 4, 2004**

**8:45 – 9:00 AM** Continental Breakfast

**9:00 AM** Welcome and Introductions

- Purpose of Professional Judgment Panels
- Role of panelists in an Adequacy Study
- Overview of activities

**10:00 – 12:00 PM** Panels meet and critique Draft Report

**12:00 – 1:00 PM** Lunch (provided)

**1:00 – 3:30 PM** Continue meetings in panel groups

- Refine prototype models
- Specify resources needed to operate the school
- Begin discussions of adjustments for schools with different student and/or school characteristics

**3:30 – 4:30 PM** Reconvene all panels for review of progress

**4:30 PM** Adjourn for the day

**THURSDAY, FEBRUARY 5, 2004**

**8:15 – 8:30 AM** Continental Breakfast

**8:30 – 11:30 PM** Reconvene in school panels

- Discuss adjustments for student and school characteristics
- Consider district support functions needed to make prototype schools work

**11:30 – 12:00** Final full group discussion

**12:00 Noon** Adjourn