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Considering Special Education Adequacy in California

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Executive Summary

The ways in which the needs of special populations – students in poverty, English learners, and particularly special education students – have been addressed in studies measuring educational adequacy vary widely. This paper analyzes how these populations have been treated across various adequacy studies, with its major focus on special education adequacy.

Special education is an increasingly important component of the overall adequacy question. Its broader consideration began with the federal Education for All Handicapped Children Act of 1975 – since renamed the Individuals with Disabilities Education Act (IDEA) – which guarantees all eligible students with disabilities a free and appropriate public education (FAPE). Prior to the passage of this legislation, U.S. schools served only one in five children with disabilities and several state laws excluded students with certain disabilities (including deafness, blindness, emotional disturbance, or mental retardation) from public schools.¹ Today, more than 12 percent of all elementary and secondary public education students have been identified for special education. In California, school-aged students (ages 6 – 21) receiving special education services make up 9.5 percent of public school enrollment. In addition, special education constitutes a considerable portion of overall K-12 public education spending. According to one national estimate, special education constituted about 13.9 percent of total K-12 spending in 1999-2000, the most recent year for which an estimate is available (Chambers, Parrish, & Harr, 2001). The percentage of students in special education and the total expenditure on these students as a percentage of overall K-12 spending has been steadily increasing on a consistent basis over the past 30 years across the nation.²

This study focuses on two primary research questions:

- 1) What analytical techniques exist for estimating the cost of an adequate education for special education students?
- 2) How might these techniques be applied to estimate the cost of an adequate education for special education students in California, and how do these cost estimates compare to what is currently spent on special education students?

In response to the first question, we conducted an extensive review of how each of the four primary approaches to measuring educational adequacy – professional judgment, evidence-based, successful schools, and cost function approaches – have included special education and other special needs populations, and present results for these students under each approach. We found that the evidence-based and successful schools approaches largely defer on the question of defining adequate special education provision. For example, in the evidence-based studies, researchers have mostly recommended that states retain their state funding approach for special education, seemingly irrespective of the system in place. The successful schools approach lacks

¹ <http://www.ed.gov/policy/speced/leg/idea/history30.html>

² See Chambers, Pérez, Harr, & Shkolnik, 2005.

strong methods for identifying marginal costs for special education. While special education students are incorporated into the econometric methods used in cost function studies, this approach may not be well-suited to account for variations in the composition of students with disabilities. Many of the professional judgment studies reviewed for this paper generated distinct add-on costs for special needs populations, which are reviewed in this paper.

As a supplement to these more traditional perspectives to measuring adequacy, we propose that the actual levels of resource provision in special education offer an important benchmark by which to consider adequate provision. The federal IDEA requires that an individualized education program (IEP) be created for every student eligible to receive special education services. The IEP is a legal contract in which the unique needs of the student must be fully examined by a multi-disciplinary team of appropriate professionals as a basis for establishing annual educational goals and for specifying the location, frequency, duration, and intensity of services necessary to make progress toward them. In a sense, each of these teams represents mini professional judgment panels. Consequently, we believe that actual special education expenditures come much closer to reflecting the ‘cost’ of adequacy than comparable measures of expenditure for non-special education students.

This paper presents estimates of special education provision in California using four approaches – all of which are largely based on actual provision. One approach draws on detailed statewide accounting data to estimate current levels of special education spending, while another applies special education resource allocation patterns estimated from a study previously conducted for the state (Parrish et al., 2003). The two remaining estimates use special education spending ratios from the national Special Education Expenditure Project to approximate special education provision that might be expected if districts in California provided special education services similar to those found on average across the nation. These ratios are applied against two estimates of spending for a general education student. The first one is based on current spending in the state, and the second is based on adequate spending (as produced by Chambers et al., forthcoming). These four estimates of adequate special education spending per student, which range from \$7,777 to \$11,600 per special education student, provide alternative bases for considering adequate special education provision in California.

The charge for this paper was to focus on special education adequacy. Within this context, we have attempted to consider and define this concept on its own, with a major product of these analyses being stand alone estimates of the cost of special education adequacy. Of the four standard adequacy methodologies, only the professional judgment and econometric approaches appear at least theoretically capable of producing comparable stand alone estimates of special education adequacy. Although there are questions as to whether stand-alone special education adequacy estimates can be derived from these types of approaches, to the extent this can be done such estimates would have an important advantage in that the needs of special education students can only be fully considered in relation to the general education services they receive. It is only in this holistic sense that special education adequacy can be fully considered.

As discussed, service levels that emanate from IEPs use professional judgment to delineate the services needed to produce specified outcomes. In this sense, they provide a strong basis for considering adequacy. At the same time, they are deficient in regard to the full consideration of

adequacy because they build on a base of general education services that may be inadequate. If this is true, they likely overstate what is needed for special education. At the same time, the current mix of general and special education services in California arguably understate what is needed in that the outcome goals set for special education students by state and federal accountability provisions are generally not being met.

In addition to the four special education adequacy estimates in this paper, it may be possible to produce additional estimates through the professional judgment and econometric studies included in this adequacy project. They would have the advantage over those presented in this paper of estimating the cost of special education adequacy within the context of adequate general education. If comparable special education adequacy numbers could be derived from these analyses, it would be interesting to compare them to the results presented in this paper.

Chapter 1: Introduction

The concept of adequacy has dominated education finance discussion over the past decade, and has increasingly been the focus of school finance litigation. These legal debates have been propelled by state constitutions that guarantee access to some standard of education. Furthermore, the educational accountability movement has thrown a spotlight on outcomes for all students, raising pointed questions about what constitutes adequate levels of education to meet state and federal standards.

A number of studies have been conducted to define the cost of adequate education provision in a particular state given its educational outcome standards. The way in which the needs of special populations – students in poverty, English learners, and particularly special education students – have been addressed varies widely.

In regard to special education, evidence-based and successful schools approaches largely defer on the question of defining adequate provision. For example, in the evidence-based studies, the researchers have mostly recommended that states retain their current state funding approach for special education, seemingly irrespective of the current system in place. Using “successful schools” as a basis for determining adequate education resources, special education is generally treated as some form of post-analysis add-on. Econometric approaches may be insufficiently sensitive to pick up differences in the composition of special education populations in the adequacy estimates they produce.³ Thus, even though virtually all of the adequacy studies that have been conducted across the states incorporate special education to some degree, the attention given to special education adequacy has been mixed and has not been as thorough as with other programmatic areas.⁴ It can also be argued that the attention on special education is not as thorough as warranted given its magnitude in terms of the number of students enrolled and its overall public education budget share.

This study attempts to advance the limited body of work on special education adequacy by addressing two primary research questions:

- 1) What analytical techniques exist for estimating the cost of an adequate education for special education students?
- 2) How might these techniques be applied to estimate the cost of an adequate education for special education students in California, and how do these cost estimates compare to what is currently spent on special education students?

³ For example, in describing the econometric approach in regard to special education, one of the major researchers using this method conveyed to the authors of this report, “We don’t try to include more detailed measures of special needs, because the cost function is too blunt an instrument to pick up subtle differences across types of disabilities.”

⁴ Adequacy determinations for English learner (EL) programs, however, have perhaps been even more marginally explored. This paper will briefly describe, but will not focus on, how EL programming has been dealt with across the various adequacy studies conducted to date. Please see Gandara and Rumberger (forthcoming) for a review of EL issues and adequacy in California.

Importance of Special Education

As a precursor to the further discussion of these two questions, let us consider the arguments as to why more attention should be paid to special education in the overall determination of adequacy.

The federal Education for All Handicapped Children Act of 1975 – since renamed the Individuals with Disabilities Education Act (IDEA) – guarantees all eligible students with disabilities a free and appropriate public education (FAPE). Prior to the passage of this legislation, U.S. schools served only one in five children with disabilities and several state laws excluded students with certain disabilities (including deafness, blindness, emotional disturbance or mental retardation) from public schools.⁵ A 1975 House Committee reported that two-thirds of students with disabilities were either totally excluded from public schools or “sitting idly in regular classrooms awaiting the time when they were old enough to ‘drop out’” (U.S. Congress, June 26, 1975, p. 2, in Verstegen, 1994).⁶

Today, more than 12 percent of all elementary and secondary public education students have been identified for special education. In California, school-aged students (ages 6 – 21) receiving special education services make up 9.5 percent of public school enrollment. In addition, special education constitutes a considerable portion of overall K-12 public education spending. According to one national estimate, special education constituted about 13.9 percent of total K-12 spending in 1999-2000, the most recent year for which an estimate is available (Chambers, Parrish, & Harr, 2001). The percentage of students in special education and the total expenditure on these students as a percentage of overall K-12 spending has been steadily increasing on a consistent basis over the past 30 years across the nation.⁷

With special education enrollment growing nationally each year, certain disability categories appear to have driven this increase over the past decade. Of the 13 federally-defined disabilities, other health impairment and autism comprised 43 percent and 17 percent, respectively, of the nearly one million new school-aged special education students across the nation since 1995. Specific learning disability – the largest individual category with 2.7 million students in 2005 – made up nearly 15 percent of the increase.

It is generally accepted that the vast majority of special education students should be held to the same academic standards as all students.⁸ Most special education students spend the majority of

⁵ <http://www.ed.gov/policy/speced/leg/idea/history30.html>

⁶ See Verstegen (1994) for a history of events leading up to the passage of the 1975 law. Note that the 1975 legislation replaced the state aid program established by the Education for the Handicapped Act of 1970.

⁷ See Chambers, Pérez, Harr, & Shkolnik, 2005.

⁸ Under NCLB, alternative achievement standards are permitted for children with the most significant cognitive disabilities. States are limited in using proficiency scores of these alternative assessments towards their Annual Yearly Progress (AYP) to 1 percent of all students (or about 10 percent of students with disabilities), unless a waiver is obtained (Federal Register, 2003). Recently proposed federal regulations limit the use of scores of modified achievement standards to 2 percent of all students (or about 20 percent of students with disabilities). This suggests that only 30 percent of students with disabilities, in total, could be held to different standards. In 2004-05, 98 percent

their day in regular classes with other students. For example, in 2005-06, more than 63 percent of special education students ages 6-11 spent 80 percent or more of their time in the regular class, as well as 46 percent of 12-17 year olds.⁹ At the same time, the nature of the education as defined for students in special education is very different from all other students, with special education students being granted by federal law a legal entitlement to “free and appropriate” educational services as specifically defined by a team of multi-disciplinary professionals and described in an individualized education program (IEP). Furthermore, unlike all other students, when a service is determined as needed by a student in special education by the IEP team, its cost can not be offered as a rationale by a school district for refusing to provide it.

Added to these issues are concerns about the growing costs of special education litigation associated with the very different education entitlement for children in special education. The IDEA established procedural safeguards – which include due process hearings, complaint resolution, mediation, and the right to a civil trial – to resolve disputes between parents and school districts regarding the education of special education students. While districts spent an estimated \$146.5 million on these activities (including litigation) in 1999-2000, this estimate accounted for only 0.3 percent of the total special education expenditures in that year (Chambers, Harr, & Dhanani, 2003). While individual cases can sometimes be quite costly for a district, applying this figure to the total special education enrollment, the expenditure per special education student is \$24. The rates at which these procedural activities occur are also reported to be relatively low, with 5 due process hearings held, 7 mediation cases, and less than 1 litigation case per 10,000 students with disabilities (GAO; Chambers et al., 2003).

Both the California and federal accountability systems have an explicit focus on the outcomes for students with disabilities. To meet adequate yearly progress (AYP) under the federal No Child Left Behind Act (NCLB) of 2001, all numerically significant subgroups, including students with disabilities, must meet the same expectations (e.g., participation rates and annual measurable objectives, AMOs) as all students.¹⁰ Thus, most districts in California (about 60 percent) face potential sanctions based on the performance of their special education students. At the school level, however, less than 8 percent had a numerically significant group of students with disabilities in 2005-06.¹¹

As a whole, students with disabilities in California have shown steady progress over time. In 2003, 13.9 percent of students with disabilities scored proficient or above in English language

of students with IEPs took statewide reading assessments, with about 12 percent being provided alternative assessments (O'Reilly, Fafard, Wagner, & Brown, 2006).

⁹ Derived from IDEA data, www.IDEAdata.org. Across all age groups, 54 percent of special education students spent 80 percent or more of their time in the regular classroom; California is slightly lower, with 50 percent of all special education students.

¹⁰ A subgroup is numerically significant for calculating participating rates if 100 or more students in this group are enrolled on the first day of testing, or 50 or more students in this group are enrolled on the first day of testing who make up at least 15 percent of the total population in that school. For calculating the annual measurable objectives, a subgroup is numerically significant if it has 100 or more students with valid scores, or 50 or more students with valid scores who make up at least 15 percent of the total valid scores. A “student with a disability” is one who receives special education services and has a valid disability code.

¹¹ Including only elementary, middle, and high schools, 683 and 719 schools had a numerically significant subgroup of students with disabilities for ELA and math, respectively, representing less than 9 percent of these school types.

arts (ELA), increasing to 14.7 and 17.0 percent in 2004 and 2005, respectively.¹² Similarly, 19.8 percent scored proficient or above in 2005 in math, up from 16.1 and 17.2 percent in 2003 and 2004, respectively. With an AMO target of 23 percent proficient in ELA in 2006, 19.6 percent of students with disabilities in California scored proficient or above.¹³ In math, 22.4 percent of students with disabilities scored proficient or above, again missing the target of 23.7 percent. Note, however, that the state as a whole met its AYP criteria in 2006, as it was allowed to adjust the percent proficiency of students with disabilities.¹⁴ The AMO targets will increase to 34 percent proficient in ELA and 34.6 percent proficient in math in 2007-08, with 100 percent proficiency across both subjects by 2013-14.¹⁵

Exhibit 1.1. Percentage of schools and districts (with numerically significant subgroups of students with disabilities) meeting the AMO targets for students with disabilities in California, and the statewide percentage of students with disabilities scoring proficient or above in English language arts and math, 2005-06

	% of schools that met AMO for students with disabilities¹	% of districts that met AMO for students with disabilities²	% of students with disabilities that met AMO statewide³
ELA	59.2%	60.7%	19.6%
Math	67.9%	61.7%	22.4%

¹ A total of 683 elementary, middle, and high schools had a numerically significant subgroup of students with disabilities for ELA. A total of 719 elementary, middle, and high schools had a numerically significant subgroup of students with disabilities for math.

² 458 of the 754 elementary, high, and unified school districts had a numerically significant subgroup of students with disabilities for ELA, while 465 elementary, high, and unified districts had a numerically significant subgroup of students with disabilities for math.

³ The statewide AMO target for ELA in 2005-06 was 23 percent; the AMO target for math was 23.7 percent.

The state accountability system – which was established prior to the NCLB – also requires schools to show improvement for all numerically significant subgroups. Students with disabilities were added as a subgroup under the state accountability system in 2005-06. Until recently, the annual performance target for these subgroups was 80 percent of the schoolwide target for each individual school.¹⁶ In 2005-06, the first year for which this information is

¹² All AYP and API performance data reported here were obtained from <http://www.ed-data.k12.ca.us>.

¹³ AMO targets vary by school level and type of local educational authorities (LEAs). The 2006 targets presented here are for unified school districts and county offices of education. Elementary and middle schools and elementary school districts had an AMO target of 24.4 percent proficient in ELA and 26.5 percent in math; high schools and high school districts had a target of 22.3 percent proficient in ELA and 20.9 percent proficient in math.

¹⁴ If the state (or individual school or LEA) does not make AYP solely because of its students with disabilities subgroup not making AMOs, 20 percentage points are added to “percent proficient or above” for that subgroup. The percent proficient rate presented here are the original figures, prior to any adjustments.

¹⁵ The 2007-08 targets reflect those for unified school districts and county offices of education. Elementary and middle schools and elementary LEAs will have an AMO target of 35.2 percent proficient in ELA and 37 percent proficient in math in 2007-08. High schools and high school districts will have AMO targets of 33.4 percent proficient in ELA and 32.2 percent proficient in math.

¹⁶ The API is a numeric index assigned to each school in California, ranging from 200 to 1000. Initially based solely on the results of the norm-referenced SAT-9, calculation of the API now incorporates the California High School Exit Exam (CAHSEE) and the California Standards Tests in ELA, mathematics, science, and history/social science, and has increased the weight assigned to these standards-based measures (the exact weight depends on the grade span of the school and, to a lesser degree, on the number of valid scores). For a school with an API score below 800, the annual performance target is to grow by five percent of the difference between its base API score and 800. For a

available under the state system, the API scores for students with disabilities statewide increased by 11 points, from 508 to 519. Of the 911 elementary, middle, and high schools statewide that had a numerically significant group of students with disabilities (under the state criteria), 56.0 percent met their API target for this group. Starting in 2006-07, the subgroup targets will be the same as the schoolwide target.

With respect to graduation rates, over 56 percent of special education students enrolled in the 12th grade (or who were 18 years or older) graduated with a diploma in 2004-05, down from 60 percent the prior year.¹⁷ While neither the NCLB nor the state accountability systems require that numerically significant subgroups be held to specific graduation rate requirements, the graduation rate for all students was 84.9 percent in 2005-06.¹⁸

These outcomes show that while students with disabilities have generally made progress over the years, they consistently under-perform in relation to other subgroups. In 2006, English learners – the subgroup closest to the performance of students with disabilities in ELA – had 5.2 percent more students score proficient or above in that subject. Similarly, students with disabilities lag behind the African-American student subgroup, which had 7.8 percent more students scoring proficient or above in this subject. The performance of students with disabilities is not even half of that across all students, with 44.8 percent and 48.0 percent proficient or above in ELA and math, respectively.

Given the lower performance levels of students with disabilities and the high educational outcomes that are expected of them under both the federal and state accountability systems, special education is increasingly a focus of education accountability provisions. Moreover, as special education continues to grow in size, both in terms of enrollment and spending, it is a major focus of attention in regard to appropriate service provision and levels of spending. Thus, we consider the research in this paper further exploring how special education has been incorporated in the considerable education adequacy work that has been conducted across the country to be timely, appropriate, and important.

Methods for Determining Alternative Special Education Adequacy Estimates for California

In response to the first research question above, we have reviewed how each of the four primary approaches to measuring educational adequacy – professional judgment, evidence-based, successful schools, and cost function approaches – have included special education and other special needs populations. Subsequently, we compare the results for these populations from each approach to the extent they are specifically delineated in the respective studies.

school with an API score of 800 or above, the target is to maintain a score of at least 800. For a school with an API score of 800 or above, the target is to maintain a score of at least 800.

¹⁷ California Department of Education (2006). *Pocketbook of Special Education Statistics, 2004-05*. Sacramento, CA: CDE Press.

¹⁸ However, graduation rates for *all* students are included as part of the AYP criteria. In 2005-06, schools were expected to have a graduation rate of 82.9 percent, an increase from 2005 to 2006 of at least 0.1, or an increase in the average graduation rate over two years of at least 0.2.

Other special populations – students in poverty and English learners – are also included in this review of prior adequacy work as a context for understanding how the cost estimates for these types of students compare to those generated for special education students under the varying approaches and individual studies. For example, to what extent is an adequate education for special education students considered to be more or less expensive than other high-needs populations? Also of possible interest is the overlap between these categories. For instance, a special education student also may be from a low-income family or be an English learner.¹⁹ The second research question for this study begins by asking how these techniques might be applied to estimate the cost of an adequate education for special education students in California. In short, given the limitations of the established methodologies and in the data currently available from the state, the four approaches that have traditionally been used to conceptualize and measure education adequacy in the aggregate (as described in this report) may not be best suited for attempting to specify special education adequacy alone.

Three studies are currently in progress to estimate education adequacy for California within the overall adequacy project (of which this paper is a part) include special education in one way or another (Chambers, Levin, & Delancey; Sonstelie & Lipscomb; Imazeki, forthcoming). However, none may lead to a stand alone estimate of special education adequacy. Although the professional judgment approach used by Chambers et al. (forthcoming) fully includes special education, due to the manner in which this approach comprehensively and simultaneously incorporates the full range of required educational services students, it may not lead to the production of a separate special education adequacy estimate. In addition, the adequacy estimate produced through Sonstelie and Lipscomb (forthcoming) relies on per student cost estimates derived from a prior special education study conducted for the state that was designed to be more of an expenditure than an adequacy analysis (Parrish, Harr, Kidron, Brock, & Anand, 2003).

Consequently, in this paper, we draw upon alternative approaches to address the latter part of the second research question for this study, i.e., how do these cost estimates compare to what is currently spent on special education students? In response to this question, we generated four estimates of special education provision in California. These range from estimates of actual spending to derived estimates that come closer to being a basis for considering special education adequacy. For example, a primary data source for estimating current special education spending in the state is the district-level Standardized Account Code Structure (SACS).

A second estimate based on actual practice builds on the AIR's prior work with the *Study of the Incidence Adjustment in the Special Education Funding Model* (Parrish et al., 2003), conducted for California. As mentioned above, the estimates of special education provision from this study are also being applied in some fashion to the overall Sonstelie and Lipscomb (forthcoming) estimate being produced for this project.

¹⁹ The National Assessment of Educational Progress (NAEP) collects information on students in grades 4 and 8, as part of its national assessment. According to NAEP data, the percentage students with disabilities in these grades who were also identified as English learners more than doubled between 1998 and 2002, from about 5 percent to more than 10 percent of all students with disabilities (Harr, Pérez, McLaughlin, & Blankenship, 2005). Conversely, about 20 percent of English language learners in grades 4 and 8 also had a disability in 2002, again more than double the 1998 figure of 10 percent (Pérez, Harr, McLaughlin, & Blankenship, 2005).

Attempting to move closer to estimating the cost of adequate special education provision, we have drawn upon findings from the national *Special Education Expenditure Project* (SEEP) to produce two additional measures of special education resources to be considered within the context of this study. Based on an extensive sample of students and education providers, SEEP provides a wealth of information about spending on special education students across the nation. As the basis for the third estimate of special education resources, SEEP results were used in conjunction with data from SACS to provide a cost estimate of special education service in California.

A fourth estimate relies on SEEP results and data derived from the Chambers et al. (forthcoming) professional judgment study mentioned above. The exact ways in which special education is treated are described in the full Chambers et al. report. For the purposes of this paper, we have applied spending ratios from SEEP to “base” adequacy amounts from Chambers et al., i.e., the amount determined to be adequate for a student receiving no supplemental services in California, to generate a final estimate of adequate special education expenditures for students in California.

The Unique Nature of Special Education Within an Adequacy Context

In interpreting these alternative approaches to the measurement of special education adequacy in the state, it is important to fully consider the nature of special education in relation to all other public education programming. Arguably, in regard to the distinction between spending and the estimation of an adequate cost, special education is unique. The word ‘cost’ is defined by economists as the minimum expenditure required to achieve any given standard of educational outcomes. However, virtually all of the data used in this study to consider special education adequacy are technically expenditure data in that they estimate what is actually spent on special education students. SACS is certainly an expenditure measure, and neither the California Incidence Study referred to above nor the national SEEP attempt to define a specific outcome, or attempt to measure success in achieving it.

On the other hand, these data arguably come much closer to reflecting ‘cost’ than comparable measures of expenditure for non-special education students. The cornerstone of the IDEA – the federal special education law – is the provision of a free and *appropriate* education (FAPE), which requires that an individualized education program (IEP) be created for every student eligible to receive special education services. The IEP is a legal contract in which the unique needs of the student must be fully examined by a multi-disciplinary team of appropriate professionals to establish annual educational goals and to specify the location, frequency, and duration of services necessary to make progress toward those goals.²⁰ The IEP represents an entitlement and obligation for services for special education students that has no counterpart for non-special education students. Moreover, the cost of services cannot be considered in determining the services necessary to provide a student with FAPE. In addition, under the federal No Child Left Behind Act of 2001 (NCLB), there are further requirements to ensure that

²⁰ Current federal law requires that the an IEP reevaluation may occur not more than once a year and must occur at least once every three years, unless the parent and the public agency agree otherwise.

professionals delivering various educational services are highly qualified.²¹ These NCLB standards apply to special education teachers, and the law also requires that all instructional paraprofessionals (including special education) meet certain qualifications as well.²²

The IDEA defines FAPE as special education and related services that are provided at public expense without charge; meet the standards of the state educational authority; include an appropriate preschool, elementary school, or secondary school education in the State involved; and are provided in conformity with an IEP.²³ Although the IDEA provides a broad definition of FAPE, it does not “set any requisite standards or levels of learning achievement for students with disabilities,” thereby leaving the courts to determine the substantive requirements of FAPE (Johnson, 2003). More than two decades ago, the U.S. Supreme Court ruled in *Board of Education of the Hendrick Hudson Central School District v. Rowley* that FAPE entitles students with disabilities to services that provide “some educational benefit”, and this precedent has generally guided subsequent court decisions regarding the appropriateness of special education services.²⁴

Educational adequacy is generally defined as a sufficient level of educational services needed for students to attain a specified outcome. While IDEA definition of FAPE does not explicitly mention “adequacy,” the IEP requires services that are necessary for students to meet the goals (e.g., outcomes) specified by the IEP team. The question is whether these specified goals represent an explicit link to educational outcomes generally required for adequacy analyses.

The regulations for the IDEA require that the educational program for students with disabilities “meet the educational standards of the state educational agency.” While this does not require that IEP annual *goals* be directly tied to state education standards,²⁵ this link may very well be implicit in the current era of state accountability, especially with the focus on outcomes for special education students under the NCLB. In aligning the IDEA with the NCLB requirements, special education law requires that states establish performance goals for students with disabilities that are “consistent, to the extent appropriate, with any other goals and academic standards for children established by the state.”²⁶ In fact, Johnson (2003) argues that educational adequacy litigation, state educational standards, and the NCLB proficiency requirements now form the substantive requirements of FAPE. These higher standards have made the “some

²¹ Under NCLB, states establish their criteria for what constitutes a highly qualified teacher. By the 2005-06 school year, provisional or emergency certifications of teachers were no longer allowed.

²² Paraprofessionals do not need to meet these requirements if their role does not involve instructional support, such as special education paraprofessionals who solely provide personal care services

²³ See U.S. Department of Education, 2006, p. 46758.

²⁴ *Board of Ed. of the Hendrick Hudson Sch. Dist. v. Rowley*, 458 U.S. 176 (1982).

²⁵ The U.S. Department of Education website <<http://www.ed.gov/admins/lead/speced/toolkit/faqs.doc>> says: “There are several reasons why IEPs are not appropriate for school accountability purposes. In general, IEP goals are individualized for each student and may cover a range of needs beyond reading/language arts and mathematics, such as behavior and social skills. They are *not necessarily aligned with state standards*, and they are not designed to ensure consistent judgments about schools—a fundamental requirement for AYP determinations. The IEP is used to provide parents with information about a student’s progress and for making individualized decisions about the special education and related services a student needs to succeed.”

²⁶ See U.S. Department of Education, 2006, p. 46772. More specifically, the California Education Code (30 EC 56138) requires that these goals and indicators be consistent with, “to the *maximum* extent appropriate,” the standards for all public school students.

educational benefit” standard established by the Rowley decision more than 20 years ago obsolete. Johnson (2003) notes, “These [adequate education] standards are subsequently incorporated into the definition of FAPE for students with disabilities by the statutory provision that requires FAPE to ‘meet state standards’ and include ‘an appropriate preschool, elementary, or secondary school education in the State involved.’”

At the same time, it should be noted that several court decisions determined that IEPs are not required to provide optimal services or to provide maximum benefit; rather the federal law “emphasizes an appropriate, rather than ideal, education; it requires an adequate, rather than optimal, IEP” (*Lenn v Portland School Committee*, 998 F.2d 1083, 1086 (1st Cir. 1993)).²⁷ It seems that one would be hard pressed in the current era, however, to argue that services sufficient to meet state accountability standards provides some form of optimization of services.

Additionally, the 2004 reauthorization of the IDEA emphasized that special education services are to be “based on peer-reviewed research to the extent practicable.”²⁸ While it refrained from providing an explicit definition in the IDEA regulations, the U.S. Department of Education noted that, “Peer reviewed research generally refers to research that is reviewed by qualified and independent reviewers to ensure that the quality of the information meets the standards of the field before the research is published.”²⁹ The evidence-based method to measuring educational adequacy – to be discussed in greater detail in Chapter 3 – relies upon such research.

The linkages between what is required of the IEP team process and more traditional approaches to defining adequacy, i.e., IEPs are based on professional judgment and to the extent possible on peer reviewed research, further establishes the argument that special education practice provides a reasonable proxy for cost as defined in an adequacy context. The most comprehensive picture of special education practice from across the nation comes from the SEEP analyses mentioned above and described more extensively in the section below. However, this is not to say that SEEP data – or other analyses of actual service provision – provide a perfect normative standard for special education services. For example, even though it would be a violation of the IEP, we know that there is likely to be some level of disparity between what is specified in a student’s IEP and the services actually provided. Indeed, recent analyses of special education provision in the Los Angeles Unified School District show only about 85 percent of special education services as specified in IEPs are actually being provided (Oliver & Fidler, 2006).

Conversely, the IEP may end up being an inflated level of services (i.e., above those that professionals might otherwise have specified) resulting from the threat of legal action by parents of a student with disabilities. In such instances, districts may acquiesce rather than fight these cases to avoid a prolonged and costly legal battle. Another drawback is that the IEPs reflect only the current annual goals and objectives for a given student, and not necessarily the services that

²⁷ See also *Board of Ed. of the Hendrick Hudson Sch. Dist. v. Rowley*, 458 U.S. 176 (1982); *JSK By and Through JK v. Hendry County School Bd.*, 941 F.2d 1563 (11th Cir. 1991); and *Walczak v. Florida Union Free School District*, 142 F.3d 119, 130 (2nd Cir. 1998).

²⁸ See U.S. Department of Education, 2006, p. 46788.

²⁹ Note, however, that the regulations clarified that failure to provide services based on peer-reviewed research does not automatically constitute a denial of FAPE, and emphasized that the decisions regarding the services are made by the IEP team according to each student’s individual needs (U.S. Department of Education, 2006).

student would require for a future benchmark (which is an advantage of the professional judgment approach in that members can consider resources required to attain a projected outcome).

At the same time, it must be recognized that observed levels of resource allocation for special education students from studies like SEEP are not based on a uniform set of outcomes or objectives for measuring student success across the nation, but rather a specific set of outcomes and objectives relevant to that particular student. Despite these caveats, we believe SEEP provides by far the most detailed estimates we have to date of what may be deemed appropriate, or adequate, levels of special education services and their costs for varying categories of disability.

In summary, because of the unique nature of special education law, estimates of actual special education spending may perhaps provide more information than originally thought about the cost of special education. Each special education student has his/her own IEP – a description of what knowledgeable professionals believe is necessary to achieve a specific set of goals and objectives for the student. To the extent that these goals and objectives are consistent with those established for the non-special education students within any given state, then the resource estimates derived from expenditure analyses such as SEEP provide one estimate of the cost of an *adequate* education. In addition, the link between special education spending and cost may become stronger over time as the proficiency targets for AYP under NCLB increase.

Conclusion

Special education expenditure estimates from studies such as SEEP and the California Incidence Study and from SACS arguably provide more information than originally thought for further considering the cost of special education adequacy. Difficulties in including and fully considering special education within the context of the more traditional adequacy approaches are discussed in Chapter 3 of this report. Accordingly, it could be argued that given that every special education student is required to have an individualized education program designed specifically for his or her needs, these expenditure estimates provide as strong, or perhaps a stronger, basis for considering special education adequacy than has resulted from many of the more traditional adequacy approaches described in this paper.³⁰

Given the perceived value of expenditure information in the consideration of special education adequacy and to provide greater context and background regarding what is known about special

³⁰ To provide full consideration of adequacy standards for students with disabilities, it is also important to consider the needs of students who receive services under Section 504 of the Rehabilitation Act of 1973 – a civil rights law that states that no person with a disability can be excluded from or denied benefits of any program receiving federal financial assistance, including all public schools. Unlike the IDEA, however, no federal funding is provided to assist in complying with Section 504. Similar to the IDEA, a student must be evaluated to determine eligibility, and if a disability is determined to substantially limit one or more major life activities, the school must develop and implement a Section 504 Plan that identifies necessary services and/or accommodations. Under Section 504, however, an “appropriate” education means an education comparable to that provided to students without disabilities, and may be defined as regular or special education services. Section 504 students may not necessarily receive special education services, but rather may receive accommodations that provide access to public education (such as a ramp for a student using a wheelchair). The extent to which any prior adequacy analyses have fully captured 504 costs, including this study which largely relies on extant data sources, is unclear.

education spending, the next chapter summarizes findings from the Special Education Expenditure Project. Chapter 3 attempts to address the first research question above through an extensive review of alternative approaches to estimating adequacy for special needs populations. Chapter 4 describes the methods used to address the second research question for this study regarding the provision of special education and reviews the four estimates from these methods. The report concludes with a summary of some implications from these findings.

Chapter 2: A Brief Overview of Special Education Spending Patterns from the Special Education Expenditure Project (SEEP)

The Special Education Expenditure Project (SEEP),³¹ based on data from the 1999-2000 school year, was the first comprehensive, nationally representative study of special education spending to be undertaken in more than a decade and the fourth in a series of studies over the past 40 years examining the nation's spending on special education and related services.³² This chapter summarizes the results of the SEEP, and compares these results to those of the three prior expenditure studies.³³

Overview of SEEP

SEEP used 23 different surveys to collect data for the 1999-2000 school year at the state, district, school, teacher and student level.³⁴ Survey respondents included special education teachers and related service providers, who were each asked to select a sample of two students with disabilities from the rosters of students they served. This provided a sample of approximately 10,000 students with disabilities from more than 1,000 schools in 45 states and the District of Columbia. In addition to the national SEEP, all 50 states were invited to extend their participation in this project to obtain state-representative samples that could be used to address state-level policy concerns related to special education finance. As a result of these additional studies, comparative data for seven states are also included in this chapter.

A Conceptual Framework for Analyzing Special Education Spending

Before presenting the analyses, it is important to define the following three concepts:

- ***Total special education spending*** includes amounts used to employ special education teachers, related service providers and special education administrators. It also includes spending on special transportation services for students with disabilities and non-personnel items (e.g., materials, supplies and technological supports) purchased under the auspices of the special education program.
- ***Total spending to educate a student with a disability*** encompasses *all* school resources, including special and general education as well as other special needs programs (e.g., Title I, English language learner services or gifted and talented education) used to provide a comprehensive educational program to meet a student's needs. Most students with disabilities spend substantial amounts of time in general education classrooms and they benefit from the same administrative and support services as all other students.

³¹ The complete SEEP findings and data can be found at <http://www.csef-air.org>.

³² SEEP was conducted by the American Institutes for Research (AIR) for the Office of Special Education Programs (OSEP) within the U.S. Department of Education.

³³ This chapter draws heavily from an article summarizing SEEP in the *Journal of Special Education Leadership* (Chambers et al., 2005).

³⁴ The full set of data collection instruments is available at http://csef.air.org/about_seep_instruments.php

- **Additional expenditures used to educate a student with a disability** are measured by the difference between the total spending to educate a student with a disability and the total spending to educate a general education student (i.e., a student with no disabilities or other special needs).

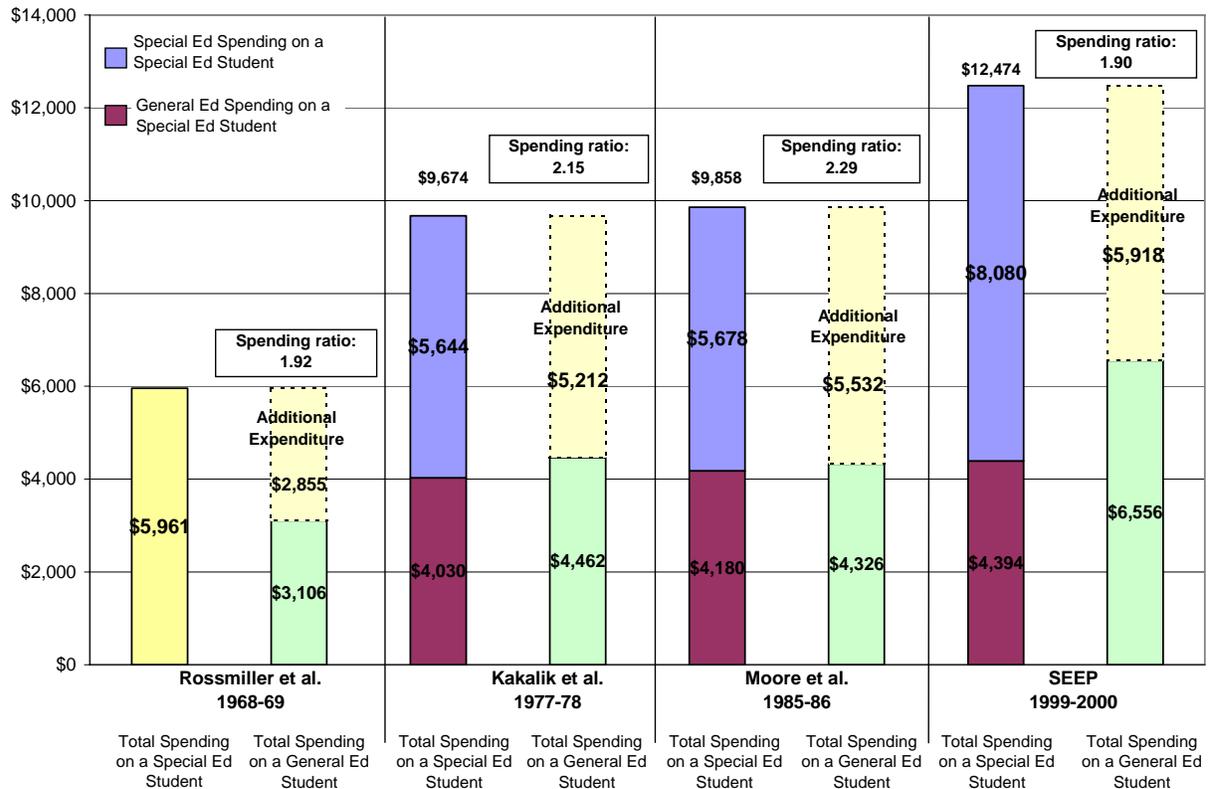
SEEP differs from previous studies in that it is based on comprehensive descriptions of all (general and special) education services received by a large, nationally representative sample of approximately 10,000 students with disabilities. Previous studies of special education spending have not attempted to obtain this kind of detail at the level of the individual student.

Total Spending and Additional Expenditure to Educate a Student with a Disability

Based on the results of SEEP, it is estimated that the U.S. spent about \$50 billion on special education services for students with disabilities in the 1999-2000 school year. Another \$27.3 billion was spent on general education services and an additional \$1 billion was spent on other special needs programs for students with disabilities. Thus, *total spending to educate all students with disabilities* amounted to \$78.3 billion. Based on these figures, the total spending to educate students with disabilities represents 21.4 percent of the \$360.6 billion total spending on elementary and secondary education in the U.S. Total special education spending alone accounts for 13.9 percent of total spending.

Exhibit 2.1 illustrates the concept of marginal expenditure (i.e., how much more is spent) on students receiving special education services. The first bar of each of the four pairs shows the average total expenditure to educate a student with a disability. These figures include instruction, related services, transportation and administration and support services.

The second-to-last bar in the exhibit shows that for 1999-2000, total expenditure for school-aged students with disabilities amounted to \$12,474, which included \$4,394 for general education services and \$8,080 for special education services. In addition to total spending, another relevant question is the *additional* expenditure on a special education student, as depicted in the second bar in each of the four panels included in this Figure. Addressing this question requires a comparison of the special education student to a consistent benchmark—the general education student receiving no supplemental services. For 1999-2000, the SEEP data indicate that the base expenditure on a general education student amounts to \$6,556 per pupil. Comparing this figure to the average expenditure for a student eligible to receive special education services, the additional expenditure amounts to \$5,918 per pupil (\$12,474 - \$6,556) for school-aged students with a disability.

Exhibit 2.1. Spending per special education student over time, in comparison to students receiving no supplemental services (in 1999-2000 dollars)

Spending Ratio and Changes in Ratio Over Time

Another way to present the additional expenditure is in the form of a *spending ratio* (i.e., the total amount spent to educate a student with a disability divided by the total amount spent on a general education student with no special needs).³⁵ As stated previously, total spending of \$12,474 on a typical school-aged student with a disability includes special and general education services. The ratio of this expenditure to that for a general education student (with no special needs) is estimated to be 1.90 (\$12,474/\$6,556) for 1999-2000, as shown in Exhibit 2.1. This suggests that, on average, the nation spent 90 percent more on the average school-aged special education student than on a general education student in the 1999-2000 school year.

Using data from SEEP and the three previous research studies by Rossmiller et al. (1970), Kakalik et al. (1981) and Moore et al. (1988), we can get a sense of how much special education spending has changed over time. The 1985-86 study (Moore et al.) estimated the special education to general education spending per student ratio to be about 2.28. That is, the *additional expenditure* on a student with disabilities was estimated to be 1.28 times the amount spent on a

³⁵ Estimates of per pupil expenditure for a general education student are based on a combination of data from the SEEP school surveys and SEEP surveys for those special education students who spend the vast majority of their time in the general education classroom. Expenditures for these students include both direct instruction as well as administration and support services provided to the typical general education student.

typical general education student. As shown in Figure 2, this number appears to have increased from 1.92 in 1968-69 (Rossmiller et al., 1970), to 2.15 in 1977-78 (Kakalik et al., 1981), to a high of 2.28 in 1985-86 (Moore et al., 1988). Rather than continuing to rise, based on the 1999-2000 school year SEEP data, this spending ratio appears to have declined to 1.90.

In constant dollars, the expenditure per pupil to educate a school-aged student with a disability increased from \$5,961 per pupil in 1968-69 to \$12,449 in 1999-2000, an annualized growth rate of 2.4 percent in real terms. Over this same time span, estimated spending per general education student increased from \$3,106 to \$6,556. In other words, total per pupil spending on the average special education student increased by 108 percent, while total per pupil spending on the average general education student increased by 110 percent.³⁶

Although per pupil general education spending increased at a faster rate than special education spending, total spending on students with disabilities increased from about 16.6 percent of total education spending in 1977-1978³⁷ to 21.4 percent in 1999-2000. Over the same period, the percentage of students aged 3-22 who were receiving special education services increased from about 8.3% to almost 12.1% of the total enrollment.³⁸ The implication is that the growth in the numbers of students served in special education programs accounts for the increase in special education spending as a percentage of total education spending.

Variations in Spending by Disability Category

Students with disabilities are not a homogeneous group; there is a wide range of student needs. SEEP provided estimates of spending by disability category. Exhibit 2.2 displays expenditures by disability category, listed in order of increasing average per pupil expenditures. In addition to the average per pupil expenditure for each disability, the exhibit shows the upper and lower bound of the 95 percent confidence interval around the estimate. Among those students not served in external placements, the highest average total expenditures were for students with multiple disabilities (\$20,095).³⁹ Four of the 13 disability categories (specific learning

³⁶ The annualized growth rate between the 1968-69 and 1977-78 studies was 5.4%, while the annualized growth rate was only 0.4% between the 1977-78 and 1985-86 studies, and 1.7% between 1985-86 and 1999-2000. The annualized growth rates for expenditure per pupil for a general education student with no special needs over each of these periods of time were 4.1%, -0.4% and 3.0%, respectively.

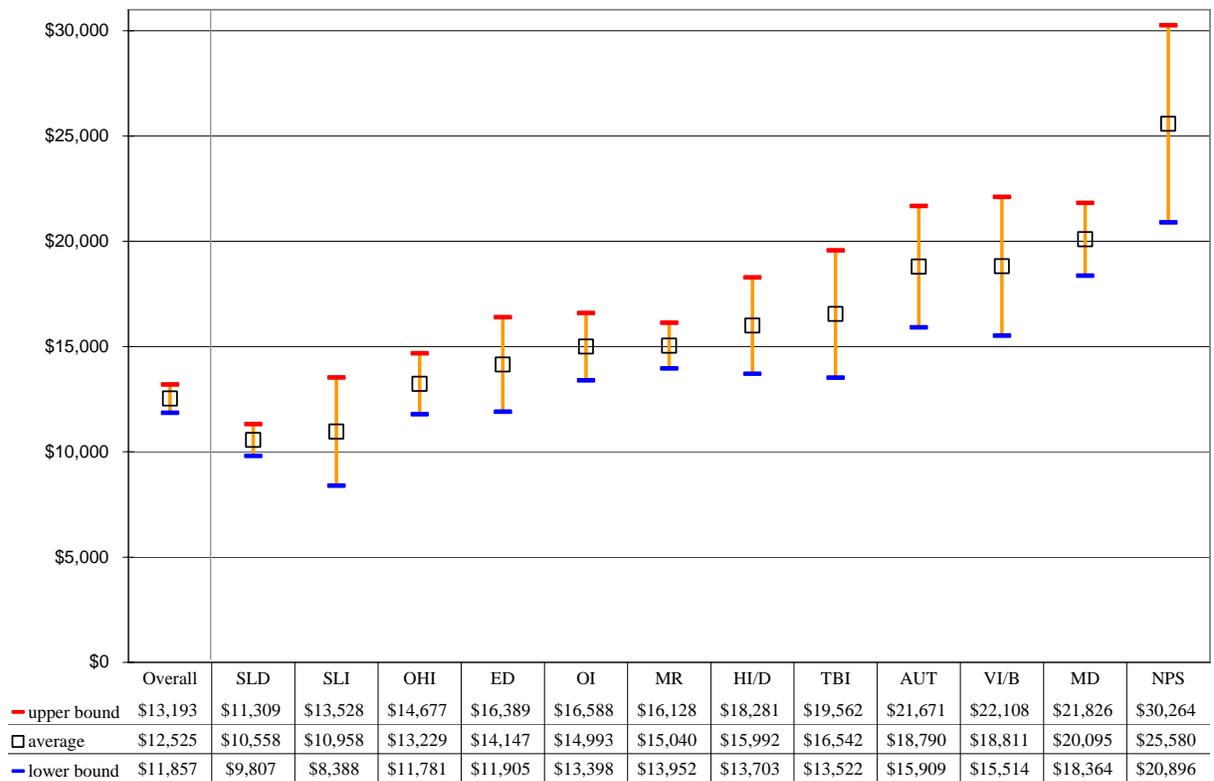
³⁷ The 1977-78 school year was two years after passage of the Education for All Handicapped Children Act, PL 94-142, the predecessor to the IDEA.

³⁸ It is difficult to obtain accurate data on the proportion of children served prior to the 1975 passage of the Education for All Handicapped Children's Act. The body of data collected in 1968-69 by Rossmiller is simply too small to provide accurate estimates comparable to those available after 1975.

³⁹ These expenditures on special education students include personnel and non-personnel expenditures on general education instruction, special education instruction and related services, other special need programs (e.g., Title I, ELL), general school and district administration and support, special education program administration and support, general and special transportation services and school facilities. Average expenditure estimates for specialized equipment are not unique to the student level and therefore may not reflect the actual expenditures for each disability type. It is expected that the estimates for disability categories with high special equipment needs are understated, and estimates for disability categories that have fewer such needs are overstated. Preschool students are not included in this data. Because of the way in which SEEP staff sampled students served in external placements, expenditures for this subset of students are not included in the expenditures by category of disability, and are reported separately as a group. These students in external placements are generally served in non-public schools or schools operated by other public agencies. This group of students exhibited the highest average total expenditure (\$25,580).

disabilities, speech or language impairment, emotional disturbance and mental retardation) make up the vast majority of the population of students with disabilities. The two most common disabilities, specific learning disability and speech or language impairment, make up more than 60 percent of the special education population. These are also the two disabilities with the lowest per pupil expenditures, at \$10,558 and \$10,958, respectively. Using the estimated average spending for a general education student of \$6,556 per year, the education expenditure for a student with a disability can range from 1.6 (specific learning disability) to 3.1 (multiple disabilities) to 3.9 (external placements) times the average expenditure for a general education student.

Exhibit 2.2. Total Expenditures on Students With Disabilities, by Disability Category (in 1999-2000 Dollars)



The estimate for expenditures on students classified as SLD has a relatively narrow confidence interval (\$9,807 to \$11,309), whereas the confidence interval for expenditures on students with visual impairments/blindness (VI/B) is relatively wide (\$15,514 to \$22,108). In fact, estimates for expenditures on students with visual impairments/blindness are not statistically significantly different from expenditures on students with hearing impairments/deafness (HI/D), traumatic brain injury (TBI), autism (AUT), or multiple disabilities (MD).

The presence of large confidence intervals around some of these expenditure estimates suggests that there is a wide range of needs represented within some of these disability categories. Two

students with the same disability may have very different expenditures because they have different needs and therefore receive different types and levels of services.

According to Simeonsson, Bailey, Smith, & Buysse (1995), disability categories do not give a complete picture of the student's needs, as they generally apply to one area of ability (e.g., vision). Moreover, the disability classification system is often subjective and arbitrary. A number of researchers have recommended describing students by their functional skills or abilities, rather than by a disability category (Bailey et al., 1993; Holt, 1957; Linden, 1963). Continuing this early work, Simeonsson and Bailey (1988) developed the ABILITIES Index to assess students' functional characteristics.⁴⁰ Further analysis by Chambers, Pérez, Socias, Shkolnik, Esra, and Brown (2004) show that student disability only explains about ten percent of the variance in per pupil spending on individual special education students, and that the ABILITIES Index improves the ability to explain the differential patterns across special education students. In fact, the data show that students with similar disabilities can have very different patterns of functional abilities and hence require different configurations of services and expenditures.

Conclusion

As described at the onset of this report, due to the unique nature of special education with the mix of services received by each student being specified through an IEP that is geared to educational outcomes appropriate to the needs and abilities of each child and which can not by law be constrained by cost, expenditure data such as those from SEEP provide one lens to consider of special education adequacy. While it is far from a perfect depiction of this measure, it provides a vast amount of information regarding the estimated cost of the mix of services actually being received across a very large sample of special education students across the country. As the traditional approaches to specifying education adequacy overall are also far from perfect, and are often not suited or do not fully consider special education adequacy, we believe SEEP data should be considered a strong basis for considering the concept of adequacy in special education, and a strong supplement to other approaches to considering this question. Two of the four non-traditional approaches to estimating adequate special education provision in California we present in Chapter 4 are largely based on these SEEP results.

⁴⁰ "ABILITIES" is an acronym for the nine functional domains measured: Audition; Behavior and Social Skills; Intellectual Functioning; Limbs; Intentional Communication; Tonicity; Integrity of Physical Health; Eyes; and Structural Status. For a more complete discussion and the rationale for the development of the ABILITIES Index, the reader should refer to Simeonsson, Bailey, Smith, & Buysse (1995).

Chapter 3: Approaches to Estimating Adequacy for Special Needs Populations

Introduction

This chapter is designed to address the first research question for this study regarding existing techniques that can be used for estimating the cost of an adequate education for special education students. Toward this end, we conducted an extensive review and include an assessment of prior studies attempting to measure educational adequacy. This chapter discusses how special needs populations were included in these studies. In conducting this review, we identified recent studies measuring educational adequacy through the National Access Network (www.schoolfunding.info), which maintains up-to-date listings of costing-out studies across the nation. We supplemented this list with studies included in cross-sectional analyses of adequacy approaches, such as Taylor, Baker, and Vedlitz (2005) and Baker (2006). While it is beyond the scope of this chapter to provide a detailed assessment of each individual study, we have synthesized information pertaining, when applicable, to special populations and present pupil weights or personnel resources specifically designated for these students under each approach. That said, the results for these populations were not always straightforward, nor were the exact methodologies used to produce these results always sufficiently described.⁴¹

The four predominant approaches to measuring education adequacy – professional judgment, evidence-based, successful districts, and cost function approaches – can be placed along a continuum developed by Taylor et al. (2005), in which the methods can be characterized as being oriented more towards resources (inputs) or performance (outcomes). Approaches with a resource-orientation are those that focus on defining “categories of educational resource inputs, including numbers of teachers, classrooms of particular dimensions, or computers and software” necessary for attaining a set of educational goals, while performance-oriented approaches begin with identifying the set of outcomes the state desires and then assess the costs of achieving those outcomes (Taylor et al., 2005, p.7). Within this framework, the professional judgment and evidence-based models are categorized as resource-oriented, whereas the successful schools/districts and cost function studies are performance-oriented. This chapter provides a brief overview of each approach in the general sense and more specifically, how special needs populations were factored into the estimates of educational adequacy.

We have included other special populations – students in poverty and English learners - in this review, as it is helpful to understand how the cost estimates for these types of students compared to special education students. How are services for special education students conceptualized in relation to other special populations within these alternative adequacy frameworks? Also, to

⁴¹ Indeed, Baker acknowledged to one of the authors for this study that he had not before attempted to compare special education results due to the limited number of studies that had considered special education, and his skepticism with the basis underlying the results (e.g., caseloads) (personal communication, July 14, 2006).

what extent is an adequate education for special education students considered more or less expensive than other high-needs populations?

Professional Judgment

The professional judgment approach is a resource-oriented method in which panels of educational professionals specify an array of services and resources they believe to be necessary for an “adequate” education. The education outcome standards for these studies may come from the state’s subject matter content standards and/or the performance expectations for students under the federal NCLB. While this approach focuses on resources at the school and district levels (inputs), the panels are guided by these educational content and performance standards (outcomes) in assessing resource needs.

Originally developed by Jay Chambers and Tom Parrish in the early 1980s as the “Resource Cost Model” (Chambers & Parrish, 1982; 1983), it has since evolved and been used in one form or other in recent years in adequacy studies in 11 states (see Exhibit 3.1). While some professional judgment studies report an average per pupil expenditure figure, many studies of this type generate a base figure that reflects the cost of an adequate education for a student with no special needs, which is applied to all students regardless of need. Along with this base amount, the studies calculate adjustments that identify additional costs for students with special needs (such as special education students, English learners, or students in poverty) and/or for factors outside the school’s control. These adjustments—which are usually expressed either as dollar figures or pupil weights that are applied to the base—are discussed in detail below.

Exhibit 3.1. Recent studies that have used the professional judgment approach

Colorado	Augenblick & Myers, Inc. (2003a)*
Connecticut	Augenblick, Palaich, Silverstein, Rose, & DeCesare (2005)*
Kansas	Augenblick, Myers, Silverstein, & Barkis (2002)*
Kentucky	Verstegen (2003); Picus, Odden, & Fermanich (2003)
Maryland	Augenblick & Myers, Inc. (2001b)*
Missouri	Augenblick & Myers, Inc. (2003b)*
Montana	Myers & Silverstein of Augenblick & Myers, Inc. (2002)
Nebraska	Augenblick & Myers, Inc. (2003c)
New York	Chambers, Parrish, Levin, Smith, Guthrie, Seder, & Taylor (2004)
North Dakota	Augenblick, Palaich & Associates, Inc. (2003a)
South Dakota	Augenblick, Brown, DeCesare, Myers, & Silverstein (2006)*
Tennessee	Augenblick, Palaich & Associates, Inc. (2003b)*
Wyoming	Management Analysis Planning Associates (MAP), L.L.C. (1997) Parrish, Harr, Pérez, Esra, Brock, & Shkolnik (2002)

* The professional judgment approach was done in conjunction with the successful schools approach.

Note: The professional judgment approach is being currently implemented in Nevada, California, and New Mexico. Another study for Oklahoma conducted by Augenblick, Palaich & Associates conducted in 2005 has not been publicly released.

Professional judgment panels are generally composed of a variety of educational professionals including teachers, school principals, business managers, superintendents and other district administrators, and sometimes state officials. Using prototype schools, the panels design programs and identify types and quantities of resources that are necessary for students to meet state and federal standards. Resources often considered in these exercises include instructional and pupil support staff, administrators, professional development, technology, and other programs such as pre-school, kindergarten, after-school, and summer school.

For each school-level prototype (e.g., elementary, middle, and high), the panels are tasked with specifying resources given the characteristics of students included in the prototypes that in their professional judgment are needed to reach the outcome standard specified for the state. Reflecting averages, the prototypes are often hypothetical. They are designed to provide a way for the panels to conceptualize programs and identify resources for particular types of students and schools. Once the resources are specified, appropriate prices are applied to arrive at the cost of providing these specifications. District costs (e.g., district administration and maintenance) are then combined with the costs derived from the school-level exercises.

In many studies, several separate panels were convened to determine resource configurations for districts of varying sizes (i.e., enrollment levels). The notion behind this approach is based on the assumption that districts of varying sizes are able to use different configurations of resources due to the economies or diseconomies of scale. For instance, in studies for Colorado, Missouri, and Tennessee, Augenblick and others (Augenblick & Myers, 2003a, 2003b; Augenblick et al., 2003b) organized a total of nine panels: four school-level panels, four district level panels, and one expert panel. The four separate school-level panels were assigned to consider resources for prototype schools in 1) very small and small, 2) moderate-size, 3) large, and 4) very large districts. With this approach, there were four sets of prototype schools, with varying enrollments and percentages of special populations, and the panels designated resources only for the school prototypes within their assigned district size category. The four district-level panels (corresponding to the size categories above) that reviewed the school-level resource specifications and designed a district-level program that was not included in the school prototypes. Reviewing the combined school- and district-level resources was an expert panel, which also considered the appropriate prices to apply to the specifications.

Similar panel configurations were used for a number of other studies.⁴² The expert panels for the MAP study in Wyoming (Guthrie et al., 1997), on the other hand, seemed more loosely organized; the study did not describe how many panels were convened, or their specific tasks, if any. The professional judgment approach used to estimate adequacy in New York (Chambers et al., 2004) employed eight separate panels to determine school-level resource requirements across

⁴² These studies include Connecticut (Augenblick et al., 2005) with 6 panels, Kansas (Augenblick et al., 2002), Kentucky (Verstegen, 2003;), Maryland (Augenblick & Meyers, 2001b), and South Dakota (Augenblick et al., 2006) with 7 panels; Nebraska (Augenblick & Myers, 2003c) and North Dakota (Augenblick et al., 2003a) with 8 panels; Kentucky (Picus, Odden, & Fermanich, 2003) with 9 panels, and Montana (Myers & Silverstein, 2002) with 11 panels. See Appendix B for a brief overview of how these panels were structured.

four categories of districts classified according urbanicity and relative fiscal needs (two panels each for New York City; large urban high-need districts; large urban low-need districts; and rural districts/small towns). In addition to these panels were two special education groups (which are described further below). A summary panel, comprised of the original panel members, assisted the research team in clarifying, interpreting, synthesizing, and revising (as needed) the results of the previous ten panels.

While it draws upon the expertise of individuals within a given state and addresses variations in student and district characteristics, this method is not without limitations. One drawback pertains to its reliance on the subjective assessments of education professionals; they may have a wealth of experience, but there may or may not necessarily be proven research to support their specifications (Odden, Fermanich, & Picus, 2003). Further, the resource specifications may simply be a reflection of current practice (Augenblick & Myers, 2003b), or panel members may have biases or be unaware of cost-effective practices, which may result in inaccurate estimates (Taylor et al., 2005).

The biggest limitation of this approach relates to the potential conflict of interest among the panel members. As mentioned above, members are generally comprised of teachers, principals and district superintendents—people who, if the budgetary allocation for the state is increased, would directly benefit in terms of increased wages and diminished workloads (Hanushek, 2005). Also, while the panelists are often instructed to allocate resources with a desired outcome in mind, the link between inputs and performance is indirect, and the approach does not assess the relationship between the two. Moreover, the resource specifications are based on a finite range of characteristics in a prototypical school. Accordingly, as the differences between an actual district and the prototype increase, the potential for error in the estimates simultaneously increase as well (Taylor et al., 2005).

How are special populations considered under this approach?

For the professional judgment studies conducted by Augenblick and Associates⁴³, panels were asked to consider resources as if *all* students in the particular school prototype did not have any special needs (e.g., no special education students, no English learners, and no students in poverty), and then to specify resources for special needs students separately. For instance, in the Nebraska study (Augenblick & Myers, 2003c), the panel allocated 18 classroom teachers, 4.5 other teachers, and 9 instructional aides for a prototype elementary school with a total enrollment of 350 students, *assuming that none of the students had special needs*.⁴⁴ The panel then determined that three additional classroom teachers, one additional teacher, and three additional instructional aides were needed for the 49 students identified as special education students. In four other studies of this type done by Augenblick and Associates (Connecticut, North Dakota, South Dakota, and Tennessee), the school-level panels specified instructional resources for

⁴³ In this report, we sometimes refer to the collection of adequacy studies led by John Augenblick to have been conducted by Augenblick and Associates. As shown in Exhibit 3.1, the specific individuals working with Augenblick on these studies varied. Note that the authors for Montana study (Myers & Silverstein, 2002) worked for Augenblick and Myers, Inc. at the time.

⁴⁴ While the Nebraska report is the only one that explicitly states this assumption, one of the main authors of several studies conducted by Augenblick and Associates confirmed that this approach was followed in all of the studies. The researchers had opted not to provide this level of detail in other reports, in interests of not confusing the reader with multiple sets of numbers.

special education students according to their degree of severity (e.g., mild, moderate, severe disabilities).⁴⁵

A similar approach was taken with other special populations, such as English learners and students in poverty. Students belonging to the special-needs groups are generally regarded as if they belong solely to one group, while the authors of these studies acknowledge that there may be overlap between the populations (e.g., an English learner who is also eligible for free lunch).⁴⁶ Generally, resources are specified for fixed demographics. While the percentage of students identified as EL, for instance, may vary *across* school levels, usually only one percentage is provided within each school-level prototype. However, in a recent study for Connecticut, Augenblick et al. (2005) structured the prototypes to account for how resources might change with varying concentrations of students receiving free or reduced price lunch (e.g., 20 percent versus 40 percent, etc.).

Also attempting to capture variations in resources attributed to changes in demographics, panels in the New York study (Chambers et al., 2004) were asked to modify their instructional programs, if needed, based on varying percentages of students in poverty and who are English learners. Selected members of these larger panels were then convened as two separate panels to further consider the specific resource needs of the special education students at these schools. As their focus was special education, these two panels included all of the special educators from the prior panels, as well as selected general educators knowledgeable about special education.

Although overall approach to applying professional judgment to define education adequacy seems similar across the studies, with special needs students reflected in the enrollment of the prototypical schools, one key difference is how these students are conceptualized. While Augenblick and Associates appear to direct their professional judgment panels to consider students with special needs as add-ons, Chambers et al. start with school prototypes with these students largely integrated in the initial exercises the panels are asked to undertake. Subsequent exercises vary these initial percentages upward and downward to assess how professionals would change the resources within a school in response to these varying student needs. While the studies for Kentucky (Verstegen, 2003; Picus, Odden, & Fermanich, 2003) also incorporate students with special needs in the school prototypes, the instructions to the panelists are unclear as to whether resources for these students were considered in the same way as Augenblick and

⁴⁵ Pupil support staff, however, were considered for all special education students, without respect to severity. In defining these categories, the authors noted in the North Dakota and Tennessee reports, “We divided the students in special education programs into three groups (mild, moderate, and severe) based on our best estimates of the proportion of students in low cost programs, such as speech, moderate cost programs, such as those for students with learning disabilities, and high cost programs, such as those for blind or autistic students.” In a recent study for North Dakota, Parrish and Harr (2006) report that Augenblick et al. (2003a) used the following disabilities for each category: mild: mental retardation, speech impairment, specific learning disability, and non-categorical disability; moderate: hearing impairment, orthopedic impairment, other health impairment, emotional disturbance, and visual impairment; severe: autism; traumatic brain injury, deafness, and deaf-blindness. Yet, none of the reports define with such specificity what disability categories were included in the mild, moderate, and severe categories.

⁴⁶ The study for Montana (Myers and Silverstein, 2002) did not consider English learners; rather, the panels designated resources for the school prototypes’ Native American populations.

Associates, or in a more integrative approach.⁴⁷ Note that these latter studies did not conduct additional exercises to modify the resources based on changes in the school's demographics.

An advantage of the Augenblick approach is that the marginal costs of these special populations is much easier to calculate and consider. When you start with a school with no special needs students and then add them in, the cost impact of their supplemental participation is clear and is easy to calculate. A disadvantage relates to the question of how realistic it is to ask education professionals to consider what is needed in a school that they likely have never worked in, seen, or likely will see. While they may have worked in schools with no English learners, it would be very atypical for a school to have no children in poverty or special education. For example, approximately a quarter of students in the average public school in California are English learners, half are in poverty, and 10 percent have been identified as special education.

Thus, under the Chambers approach, it seems that professional panel members are more likely to be attempting to specify appropriate resources in the types of schools in which they have had experience and professional knowledge. This type of approach also emphasizes a more integrated view of special needs students, and acknowledges the reality that in California at least students with no special needs (i.e., no poverty, EL, and/or special education) are in the minority.

A possible disadvantage of the Chambers approach is that breaking out and separately considering the marginal cost of serving special populations is less straightforward than under Augenblick. For this reason, and because at the time of this study there is only one Chambers et al. point of comparison,⁴⁸ the resource implications of these alternative approaches to considering special populations under professional judgment adequacy is difficult to assess.

How special education populations were conceptualized under the MAP (Guthrie et al., 1997) approach for Wyoming is ambiguous. For example, the school prototypes created by MAP which identify the key components for an adequate education do not specify personnel resources for special needs populations (special education, poverty, and ELs); rather, these student groups appear as categorical funding programs.

The subsequent Parrish et al. (2002) study, focusing exclusively on special education, was commissioned to further consider the Wyoming's funding for special education and the extent to which it resulted in the provision of adequate special education programming statewide.⁴⁹ This study appears to be the only one focused exclusively on special education adequacy. In contrast to the aforementioned studies which defined resources at the school- and district-levels, the researchers for the Parrish et al. study collaborated with a single panel to determine adequate state-level ratios of special education personnel to total enrollment which could then be applied across all districts. Adjustments for remote districts to account for the added costs of itinerant personnel, and variation in special education administrative personnel based on district size were

⁴⁷ The demographic characteristics of the school prototypes designed by Picus, Odden, & Fermanich (2003) excluded the percentage of students with severe disabilities.

⁴⁸ It should be noted, however, that the Chambers et al. approach was taken with the current California adequacy study and will also be used in a forthcoming study for New Mexico. .

⁴⁹ In fact it was determined that this approach did not result in a uniform standard of adequate special education provision across the state. Similar student populations across the state seemed to receive very different levels of service depending on the district in which they were enrolled.

also incorporated into the model. Note that in this particular study, student outcomes were not explicitly delineated.

Because the prior MAP study established a definition of adequacy for all students except special education, the Wyoming special education study could at least theoretically estimate the marginal needs of special education student on top of an adequate base of general education resources. That is, how much more is needed in programs like special education for students to achieve a specified outcome standard is at least somewhat dependent on the base resources they are receiving under general education.

Before reviewing the results from these various studies, it is important to note that Picus, Odden, and Fermanich (2003) explicitly omitted students with severe disabilities in costing out adequacy for Kentucky, instead opting to use current expenditures for this group. Other than stating that this decision was made after discussions with the state panel and the state education commissioner, the researchers do not provide any additional rationale.⁵⁰ This reliance on existing levels of expenditures or funding for special education is observed with these researchers in other adequacy approaches as well.

What are the results for special populations under this approach?

Exhibits 3.2a – 3.2c present the results from selected professional judgment studies that reported base estimates and the weights for students in poverty, who are English learners, or identified for special education. Studies that did not produce a separate per pupil cost estimate for these students are not represented in this table (e.g., Chambers et al. 2004).⁵¹ Note that in some cases we estimated the weights using the marginal per pupil dollar figure for students with special needs (e.g., the additional expenditure above the base cost estimate).

For each state except Maryland, the researchers organized the resource exercises by district size (e.g., small, moderate, large, and very large), resulting in a unique base and set of pupil weights for each size category. As mentioned, the base estimate represents the per student cost of educational resources required for a student with no special needs to achieve a specified outcome.⁵² While this base is applied to all students, students with special needs—such as special education students, English learners, and students in poverty—generate supplements that reflect the additional costs to educate these populations, according to the panel deliberations (Columns H, J, and L). Using Kansas as an example, each student in a very small district would require \$10,924 (in 2004-05 dollars after adjusting for regional differences) to reach the

⁵⁰ “During the discussions with the state level panel, in conjunction with the recommendation of Commissioner Wilhoit, it was agreed that for the purpose of the cost estimates generated for this study, current expenditures for central office administration, pupil transportation operations and maintenance, and special education for severely disabled children would be used rather than attempt to estimate a prototype district model, or models for these other functions” (Picus, Odden, & Fermanich (2003, p. 15).

⁵¹ Although the panels identified personnel resources for students with mild and moderate disabilities for school prototypes in Kentucky, Picus, Odden, & Fermanich (2003) generated only statewide aggregate figures (e.g., no per pupil estimates).

⁵² This base expenditure generally includes personnel salary and benefits, technology, professional development, and assessment costs, and supplies and materials. It often excludes transportation, food services, other services schools provide such as adult education, or capital outlay and debt service related to facilities.

educational standards established for this particular study. A special education student in the same district would require 86 percent more dollars—or \$9,395 in addition to the base estimate.

Exhibit 3.2a. Base Estimates and Pupil Weights for Special Needs Populations from Selected Professional Judgment Studies

State	Authors (Publication Year)	District Type / Size	Enrollment Size	Estimate Year	Base Estimate (Unadjusted) [1]	Base Estimate Adjusted to 2004-05 \$ (ECI) and Regionally Adjusted (GCEI)	SE Weights [2]	SE as % of All Students in District Prototypes [3]	EL Weights	EL as % of All Students in District Prototypes [3]	At-Risk / Poverty Weights [4]	At-Risk / Poverty as % of All Students in District Prototypes [3] [4]
A	B	C	D	E	F	G	H	I	J	K	L	M
Colorado [a]	Augenblick & Myers, Inc (2003a)	Very Small	200	2001-2002	\$16,373	\$18,345	0.86	12	1.25	1	0.26	32
		Small	200-800		\$10,357	\$11,604	1.15	13	0.85	4	0.29	29
		Moderate	800-3,000		\$8,008	\$8,972	1.15	13	0.51	7	0.36	27
		Large	3,001-12,500		\$6,815	\$7,636	1.45	12	0.57	11	0.37	27
		Very Large	12,500		\$6,951	\$7,788	1.11	11	0.70	11	0.56	24
Kansas	Augenblick, Myers, Silverstein, & Barkis (2002)	Very Small	324 or less	2000-2001	\$8,581	\$10,924	0.86	14	0.14	2	0.22	35
		Small	325-555		\$7,361	\$9,371	0.94	14	0.17	2	0.30	35
		Moderate	556-3,600		\$6,683	\$8,508	1.16	13	0.84	3	0.51	26
		Large	More than 3,600		\$5,811	\$7,398	2.08	14	1.03	4	0.44	36
Kentucky [a]	Verstegen (2003)	Small	125-2,885	2001-2002	\$7,186	\$8,924	1.20	16.1	0.12	0.42	0.12	59
		Moderate	2,935-8,074		\$6,788	\$8,429	1.24	16	0.12	0.54	0.12	55
		Large	8,155-80,378		\$6,551	\$8,135	1.26	14.4	0.12	2.19	0.12	49
Maryland [5]	Augenblick & Myers, Inc. (2001b)	K-12 Average	30,000 (avg)	1999-2000	\$6,612	\$7,655	1.17	13.5	1 [6]	2	1.39	31
Missouri	Augenblick & Myers, Inc. (2003b)	Very Small	Less than 200	2001-02	\$11,968	\$13,932	0.73	16	--	0	0.28	48
		Small	201-600		\$8,519	\$9,917	1.20	15	--	0	0.32	45
		Moderate	601-2,500		\$8,441	\$9,826	1.15	17	1.09	1	0.38	41
		Large	2,501-10,000		\$7,832	\$9,117	1.23	15	0.57	1	0.35	34
		Very Large	More than 10,000		\$8,161	\$9,500	1.29	15	0.58	1	0.31	34
Montana [a]	Myers & Silverstein (2002)	Small	Less than 500	2001-2002	\$8,041	\$9,821	1.07	12			0.22	37
		Moderate	501-1,200		\$6,751	\$8,245	1.30	13			0.27	40
		Large	1,201-3,000		\$6,004	\$7,333	1.20	12			0.30	35
		Very Large	More than 3,000		\$6,048	\$7,387	1.45	12			0.35	24
Nebraska [a]	Augenblick & Myers, Inc (2003c)	Elementary Small	99 or less	2000-2001	\$8,049	\$10,335	0.41	15	0	1	0	19
		Elementary Large	100 or more		\$6,527	\$8,380	1.39	12	0.40	7	0.16	36
		K-12 Very Small	249 or less		\$11,257	\$14,454	0.99	14	0.98	1	0.14	39
		K-12 Small	250-599		\$8,169	\$10,489	1.47	14	1.37	1	0.20	33
		K-12 Moderate	600-3,999		\$7,653	\$9,826	1.07	14	0.87	4	0.34	27
K-12 Large	4,000 or more	\$5,845	\$7,505	1.57	13	0.97	5	0.42	32			

[See notes for this table on the following page]

Exhibit 3.2b. Base Estimates and Pupil Weights for Special Needs Populations from Selected Professional Judgment Studies

State	Authors (Publication Year)	District Type / Size	Enrollment Size	Estimate Year	Base Estimate (Unadjusted) [1]	Base Estimate Adjusted to 2004-05 \$	Base Estimate Adjusted to 2004-05 \$ (ECI) and Regionally Adjusted (GCEI)	SE Weights [2]			SE as % of All Students in District Prototypes [3]			EL Weights	EL as % of All Students in District Prototypes [3]	At-Risk / Poverty Weights [4]	At-Risk / Poverty as % of All Students in District Prototypes [3] [4]
								Mild	Moderate	Severe	Mild	Moderate	Severe				
A	B	C	D	E	F	G	H	I	J	K	L	M					
North Dakota	Augenblick, Palaich & Associates (2003a)	Elementary Very Small	Less than 100	2001-2002	\$11,593 [8]	\$12,811	\$14,975	0.52	0.52	--	19	2	0*	--	0	0.21	39
		Elementary Small	More than 100		\$7,877 [8]	\$8,705	\$10,175	0.73	0.73	--	15	2	0*	--	0	0.30	32
		K-12 Very Small	Less than 150		\$10,213 [8]	\$11,286	\$13,192	0.60	0.60	1.24	13	2	0*	--	0	0.24	44
		K-12 Small	150-275		\$6,521 [8]	\$7,206	\$8,423	0.91	0.91	1.93	12	2	0*	0.41 [7]	1	0.21	40
		K-12 Moderate	276-2,800		\$6,005 [8]	\$6,636	\$7,757	1.08	3.09	6.02	10	2	0*	0.77	1	0.37	31
		K-12 Large	More than 2,800		\$6,662 [8]	\$7,362	\$8,605	0.71	2.11	4.96	10	3	0*	0.91	2	0.41	21
South Dakota [a]	Augenblick et al. (2006)	Very Small	221	2003-04	\$8,641	\$8,926	\$10,437	0.66	1.25	3.91	11	4	1	0.39	1	0.24	40
		Small	338		\$8,173	\$8,442	\$9,872	0.64	1.64	4.31	12	3	1	0.39	1	0.20	37
		Moderate	832		\$7,644	\$7,896	\$9,233	0.87	2.19	5.47	9	4	1	0.90	3	0.52	23
		Large	5,320		\$6,362	\$6,572	\$7,684	1.33	2.10	3.57	9	4	1	1.12	3	0.69	23
Tennessee	Augenblick, Palaich and Associates, Inc. (2003b)	Small	Less than 2,000	2001-2002	\$6,949	\$7,679	\$8,454	0.51	0.78	3.10	10	2	1	0.66	1	0.25	50
		Moderate	2,001-5,000		\$7,035	\$7,774	\$8,558	0.69	0.92	3.45	11	2	1	0.56	1	0.19	46
		Large	5,001-19,000		\$6,640	\$7,338	\$8,078	0.54	1.05	2.87	11	2	2	0.79	1	0.22	39
		Very Large	More than 19,000		\$6,207	\$6,859	\$7,551	0.48	0.98	2.64	11	2	1	0.47	2	0.22	43

Exhibit 3.2c. Base Estimates and Pupil Weights for Special Needs Populations from Selected Professional Judgment Studies

State	Authors (Publication Year)	District Type / Size	Enrollment Size	Estimate Year	Base Estimate (Unadjusted) [1]	Base Estimate Adjusted to 2004-05 \$ (ECI) and Regionally Adjusted (GCEI)	SE Weights [2]			SE as % of All Students in District Prototypes [3]			EL Weights	EL as % of All Students in District Prototypes [3]	At-Risk / Poverty Weights [4]					
							Mild	Moderate	Severe	Mild	Moderate	Severe			10%	20%	30%	40%	60%	80%
A	B	C	D	E	F	G	H	I	J	K	L									
Connecticut	Augenblick et al. (2005)	K- 6/8	360	2003-04	\$9,414	\$8,488	1.38	2.17	6.62	7	4	1	0.16	3	0.34	0.28	n/a	n/a	n/a	n/a
		Small K-12	2,065		\$9,223	\$8,316	1.34	2.11	4.88	7	4	1	0.77	3	0.62	0.44	0.38	n/a	n/a	n/a
		Moderate K-12	4,970		\$10,388	\$9,366	0.99	1.54	4.18	7	4	1	0.68	3	n/a	0.50	n/a	0.39	0.38	n/a
		Large K-12	14,160		\$11,639	\$10,494	1.00	1.30	2.97	7	4	1	0.68	3	n/a	0.41	n/a	0.33	0.26	0.24

* There are students in the severe disability category, but the number is too few to show up as even one percent.
Note: Italicized figures represent those estimates or weight derived from the researchers conducting the study - not those emanating directly from the professional judgment resource specifications.
[a] AIR estimated the weights for these studies using the marginal cost dollar figures presented in the reports. For Versteegen (2003), please note that the weights calculated by AIR using the marginal dollar figures do not align with what the author posed in the text of her report. For instance, Versteegen noted that funding for ELs was weighted 0.15; however, AIR's calculations using the prototype information produced weights of 0.12.
[1] Unless otherwise noted, base estimate includes personnel, technology, and support services. It excludes transportation, food services, other services schools provide such as adult education, or capital outlay and debt service related to facilities.
[2] The studies for all states included in the table, except for North Dakota and Tennessee, produced a single ratio for special education students without distinguishing between the different degrees of need. The authors of the North Dakota and Tennessee studies, meanwhile, differentiated between the varying intensity of disability (e.g., mild, moderate, severe).
[3] The authors of the studies calculated these figures using data on the actual proportion of students in each district type.
[4] For all studies except Colorado and Connecticut, at-risk students are determined using eligibility for free or reduced price lunch as a proxy measure. Colorado used eligibility for free lunch only, and Connecticut used students receiving free or reduced price lunch. Some of the district prototypes in the Connecticut study did not have certain levels of proportions of these students (the districts are indicated with n/a).
[5] The study team made a decision that the panels "would focus their attention on schools, and on a school district, with statewide average characteristics in terms of school sizes, district size, and student demographics." No distinction was made for district size.
[6] The weight for English learners was set to 1 by the researchers for the Maryland study. They note, "It was difficult for panel members to assign specific costs – we estimated the excess costs for LEP students to be the same as the base cost (that is, an LEP student costs twice as much as a "regular" pupil)" (Augenblick & Myers, 2001b, page 17).
[7] The original weight for EL students in small K-12 districts was 2.04. Based on the statewide panel's belief that the same cost would apply to as many as five times as many students, the study authors recalculated the weight to 0.41.

Except where noted, the results shown in Exhibits 3.2a – 3.2c are those coming from the professional judgment deliberations, and do not necessarily reflect the adequacy recommendations ultimately made by the researchers conducting these studies.

A careful distinction should be made between the results emanating *directly* from the work of the professional judgment panels and the recommendations made by the researchers for implementing an adequacy-based funding system. In some studies, Augenblick and Associates recommend modified weights, particularly if they believed the weights derived from the panel were too high or low. For instance, Augenblick and Myers (2003b) adjusted the special education weights for Missouri that originally ranged from 0.73 – 1.29 to 0.90 – 1.25, and applied 0.60 for English learners, although the panel results ranged from 0.57 to 1.09.⁵³ In Connecticut, Augenblick et al. (2005) rejected outright the panel-derived weights for the K-6/8 districts given that they were significantly different, with very high weights for students with severe disabilities and low weights for ELs, in comparison to K-12 districts. In place of the panel-derived weights, Augenblick et al. developed formulas using the relationship found with the K-12 weights, whereby weights for special education generally decrease as district size increases and EL weights remain essentially the same.⁵⁴

While these formulas may smooth out the relationships observed using the panel-derived weights and may not produce radically different numbers, it is important for readers to distinguish between actual derivatives from the panels and changes introduced by the researchers. Indeed, it might be expected by the states for which these studies are conducted that the researchers bring their own expertise and interpretations to the table, particularly when addressing the exact ways in which information from the panels could be implemented.

In another example of resource decisions made by researchers conducting the studies, Augenblick and Myers (2001b) set the pupil weight for ELs to 1.0 in Maryland, explaining, “It was difficult for panel members to assign specific costs – we estimated the excess costs for LEP students to be the same as the base cost (that is, an LEP student costs twice as much as a “regular” pupil)” (p. 17). Yet, this estimation is not entirely transparent, as authors note elsewhere in the report that the weight was based on their experience and “understanding of what policy makers in other states would like to happen although it is higher than what many states use” (p. 3, 23).

Vestegen (2002) also appeared to supplement or modify the panel specifications. Instead of costing out the personnel resources specified by the panels for special education students and students in poverty in Kentucky, Verstegen used the state’s current funding weights to estimate marginal spending, and drew upon weights used in other states (namely Florida and Texas) for

⁵³ Believing the weights originating from the panels in the Kansas study to be too high in certain instances, Augenblick et al. (2002) devised alternative formulas for calculating weights that varied according to the size of the district.

⁵⁴ In this study, the researchers also replaced the base of large K-12 districts with that of the moderate district, and instead reflected the extra costs associated with large districts with an “urban factor” of 0.121 to be applied to districts with more than 9,000 students and very diverse student populations (measured by more than 50 percent of the students receiving free or reduced price lunch). This new base for the K-12 districts resulted in slight changes to the weights for the special needs populations.

English learners.⁵⁵ While the report notes that this approach was adopted by the panels, it is not apparent how Verstegen converted the current state weights and proposed EL weights into the marginal cost figures shown in the report, nor was any rationale provided as to why the current state funding weights (or the proposed EL weights) were considered appropriate in lieu of the panel-derived resources.

Generally, in Exhibits 3.2a – 3.2c, we observe declining base cost estimates as the district size moves from small to large, reflecting expected efficiencies in educating greater numbers of students. Conversely, although the pattern is not always consistent, the pupil weights for special education students tend to increase as the size of the district increases. However, higher weights do not necessarily translate to more dollars for these students, as the base costs to which these weights are applied are smaller. In all but four of the studies presented (Kansas, Missouri, North Dakota, and Montana), the low base estimate for the largest districts offsets the high weights for special education students, thereby generating fewer resources per special education student in the largest districts in comparison to those in the smallest. On the other hand, in Kansas and North Dakota, the difference between the special education add-on costs for the smallest and largest districts is quite substantial, with the largest districts generating between \$6,000 and \$10,200 more per special education student.⁵⁶

Contrary to the general pattern observed, Connecticut (Exhibit 3.2c) shows increases in base cost estimates and declines in the special education weights as district size increases. As mentioned, the panels considered resources for schools with varying concentrations of students receiving free or reduced price lunch. Considering districts with a 20 percent concentration of students in poverty, the pupil weights range from 0.28 to 0.50, depending on district size.

As the results from each study use varying district size categories, to facilitate comparison across the studies we have shaded scale-efficient district rows in Exhibit 3.2. These are districts with an enrollment range of about 2,000 to 6,000, which were determined to yield the optimum potential for cost efficiency in Andrews, Duncombe, & Yinger, 2002.⁵⁷ To qualify as a scale-efficient district in this comparison, the lower range of the district size had to be at least 2,000 students.

The base estimates in these “scale-efficient” districts range from \$7,333 in Montana to \$9,117 in Missouri (Col. G). These dollar estimates have been uniformly adjusted to 2004-05 dollars and

⁵⁵ “For special needs students... prices are based on funding averages. Current State funding weights for special education and low-income students are adopted by the panels. However, both free and reduced price lunch students are included in the “low income” student count. Current low-income students are targeted through Federal free lunch eligibility. The inclusion of reduced price lunch students adds on average, 10.83 percent in additional students (ADA) ranging from none to 22 percent among school districts. Limited English Proficient student funding, weighted at 15 percent, is based on current practice in other States” (Verstegen, 2003, p. 16-17).

⁵⁶ This upper range represents the difference between the smallest and largest districts using the moderate disability weights for North Dakota. Using the severe weights, the gap increases to more than \$26,000 per special education student.

⁵⁷ Please note that we do not assess whether the adequacy results for districts in these size categories are considered efficient. Rather, the identification of scale-efficient districts using the work of Andrews et al. (2002) provides a common point for comparing the results from the professional judgment studies, which used various district sizes. Andrews et al. (2002) reviewed literature on economies of scale in education, and found that districts with 2,000 – 4,000 students obtain considerable savings over a district with 500 or less students. Costs per student decrease slightly until enrollment reaches approximately 6,000 students.

for regional cost differences by applying a geographic cost of education index (Chambers, 1997). However, cross-state comparisons should be made with caution as states have differing educational standards, and some studies were conducted prior to NCLB, which might be expected to result in higher resource specifications. Moreover, in two fairly recent studies, Augenblick et al. (2005; 2006) have moved away from the concept of applying a single set of professional judgment bases and weights to categories of districts based on total enrollment. The authors emphasize, “While this is the basic information produced by the professional judgment analysis, it is impossible to use this information ... to estimate the cost of an adequate education in districts that have different characteristics from the hypothetical districts...” (Augenblick, 2005, p. 22). With this in mind, the bases and weights presented for Connecticut and South Dakota should not be extrapolated outside the characteristics provided for the district prototypes.

As mentioned, and shown in Column H of Exhibit 3.2, only North Dakota and Tennessee show varying special education weights with respect to the degree of student severity—mild, moderate, or severe—while all of the other studies generated a single special education weight. In these two studies, the special education weights generally increase from mild to moderate to severe, as expected, with the exception of the four smallest district size categories in North Dakota, in which the weights for students with mild and moderate disabilities were set at the same level. As students with severe disabilities comprise a small percentage of the total population (e.g., generally 1 percent, according to the prototypes developed for the studies in Exhibit 3.2) and generally have extremely high weights, it may not be appropriate to compare them to studies that produced a single weight for special education students. Excluding severe disabilities, the weights for special education shown in Column H for “scale efficient” districts range from 1.17 for all special education students in Maryland to 2.11 for special education students with a moderate disability in North Dakota. Since these weights are calculated relative to the base estimate and are added to the base cost, a weight of 2.11 translates into a total expenditure of \$26,762 $((2.11 \times \$8,605) + \$8,605)$ for a special education student with moderate needs in North Dakota, compared to \$16,611 $((1.17 \times \$7,655) + \$7,655)$ for a special education student in Maryland.⁵⁸

Overall, cost comparisons of special education adequacy specifications across studies using the same approach are complicated by the different base amounts emanating from these studies, the varying approaches to size distinctions across districts, the percentage of students identified for special education, and varying practices with how students are assigned to categories of disability and how “severity” is conceptualized.

As mentioned, some studies generated more comprehensive measures of adequate spending per pupil which could be applied district-wide and were designed to reflect the special needs of the students enrolled. The New York study (Chambers et al., 2004) is one such example. While the study did not generate weights per se, the researchers assessed an overall adequate expenditure per student for the state and how this value would change in accord with varying compositions of special needs students enrolled. They noted the differential impact of poverty, English learners, and students in special education on additional costs relative to different school levels. Although

⁵⁸ Note that these estimates emanate from panel recommendations from these states and that the base costs used in these calculations are from Column G of Exhibit 3.2, which are been adjusted into constant dollars and for variations in regional cost, as described above.

student weights for categories of students such as those in special education could be generated from such an approach, it is more oriented to a holistic approach to the consideration of adequate education funding for a district. As such, its primary focus is on a block funding amount that incorporates a number of cost considerations ranging from variations in student needs (e.g. percentage of students in special education) to regional cost variations (e.g. cost differences for teachers in varying regions throughout the state), to scale (e.g. small schools in sparsely populated areas are generally of higher cost per student).

With respect to Wyoming, the state was reimbursing districts for 85 percent of special education expenditures at the time that MAP conducted its study in 1997. MAP recommended that the state continue with the current approach in the short term, but also develop a data collection that would allow the state to implement a census-based formula for funding special education.⁵⁹ Wyoming subsequently increased the reimbursement to 100 percent,⁶⁰ which was recommended for continuation when MAP updated its model in 2002 (Smith, 2002). As noted, the subsequent Parrish et al. (2002) study for the state focused solely on special education. In this study, it was assumed that an adequate base was already in place, as determined by MAP. Focusing on a single statewide set of special education resource standards, Parrish et al. (2002) did not generate a weight or amount per special education student. Rather, this approach yielded a block grant amount for each district that reflected recommended statewide special education personnel ratios and other factors such as school size. These ratios are presented in Appendix A.

Evidence-Based

The evidence-based approach is also a resource-oriented model. While professional judgment and evidence-based approaches are generally described as different, in application the differences may be more a matter of emphasis than overall approach. Using the evidence-based approach, researchers attempt to draw upon resource specifications that have been shown by research to be effective in improving student achievement. Presumably the “evidence” underlying this approach is updated to reflect recent progress in the state of what is known in regard to cost-effective resource allocation practices from research, and perhaps in ways in which the researchers believe this evidence should be applied under varying state conditions. Once these “effective practices” have been determined, the second step is to estimate the cost of each input, which is then used to calculate an adequate spending base for each school.

Under the professional judgment approach, while panel members are encouraged to draw upon research in their deliberations, an underlying premise is that research generally does not provide clear guidance regarding which particular resource allocation strategies, or mix of strategies, will lead to a given set of education outcomes in a state. In these studies, the attempted link between research and levels of “adequate” resources specified for the state is not touted as the critical focus, as it is in the evidence-based approach. In reality, both are guided by research to the extent that the researchers interpret the research as providing clear guidance and both tend to rely on

⁵⁹ The MAP report (1997) does not clearly identify how special needs populations were considered by the panels in the Wyoming study, nor does it state if the panels themselves recommended changes to the funding formula.

⁶⁰ Under this approach, the state reimbursed districts for the full cost of all approved local special education expenditures.

professional judgment to apply what is known from research in a practical way to determine adequate funding for the state under study.

Early evidence-based analyses concentrated on Comprehensive School Reform (CSR) models, while the more recent ones have focused on integrating an assortment of “effective” strategies. Three sources of evidence are generally used in this approach: 1) research with randomly assigned treatment, 2) research with other types of controls or statistical procedures that isolate the effect of a treatment, and 3) best practices as exemplified by a comprehensive school design or from school- or district-level studies (Odden, Picus, Fermanich, & Goetz, 2004).

While these studies are said to be guided by research “evidence,” in fact they often also incorporate review panels to modify the evidence in ways, presumably based on professional judgment, they believe is most appropriate in deriving adequate resource guidelines for each particular state. Four of the six evidence-based studies listed in Exhibit 3.3 also involved collaboration with a committee, as well as separate professional judgment panels to review and revise the “evidence-based” research recommendations. It appears that it is through this professional input that variations are introduced into the levels of resources resulting from each evidence-based study, as the literature cited and the consultants’ recommendations based on that evidence remain fairly similar across all of the studies.

Exhibit 3.3: Studies that have used the evidence-based approach

Arizona	Odden, Picus, Fermanich, & Goetz (2004)*
Arkansas	Odden, Picus, & Fermanich (2003)*
Kentucky	Odden, Fermanich, & Picus (2003)
New Jersey	Odden (1998)
Washington	Odden, Picus, & Goetz (2006; in progress)*
Wyoming	Odden et al. (2005)*

* These studies involved a committee and “professional judgment” panel component to review the consultants’ resource specifications.

Odden, Picus, and Fermanich (2003) argue that none of the existing approaches, such as the successful schools, professional judgment, and cost function approaches, provide evidence of a direct link between educational practices and academic performance at the school level. The evidence-based approach has two main advantages on the surface: 1) it makes use of existing empirical research that identifies effective education-related strategies and provides a direct link between practice and outcomes; and 2) it is relatively simple, and its results can be easily understood by policymakers and the public alike.

However, the evidence-based approach also has a number of drawbacks. One concern underlying the evidence-based approach is a general lack of clarity regarding the extent to which the final adequacy determinations resulting from these processes emanate from the research, as opposed to the interpretation of the researchers conducting the study, as opposed to relying on the professional opinions of local practitioners and policy makers. In states where review panels are *not* called upon within the evidence-based approach, is it determined that the evidence is more clear than in states where they are used? How is it determined where professional judgment is

needed, and when it is not called upon is it simply the judgment of the research team that converts the sometimes vague guidance the research may provide into specific recommendations?

Another concern pertains to its potential for selective identification of the research used. While there is a growing body of literature, research on effective (and cost-effective) educational strategies and programs remains sparse, and may yield conflicting results. Another disadvantage to this approach is that it promotes a “one size fits all” solution that is insensitive to the fact that states have different desired educational outcome specifications (Chambers and Levin, 2006). There also appears to be a disconnect between the specified resources and how schools are expected to use the funds resulting from the evidence-based prototypes. After providing detailed justifications for the resources, the consultants in the Kentucky, Arkansas, and Arizona studies conclude that the schools should have the flexibility to use the funds as they see fit (provided that they are held accountable for the results). Furthermore, as detailed below, rarely are resources for special education students taken into consideration—rather, the consultants defer to the current state system for funding these students.

These concerns are accentuated for areas such as special education in which research provides very little guidance in regard to specific resource allocation practices or strategies clearly linked to a specified set of student outcomes. Concerns in regard to the application of this approach to the consideration of special education adequacy are further discussed below.

How are special populations considered in this approach?

At least some evidence-based studies cite research on strategies that specifically benefit “struggling students”—which the consultants define as students in poverty, English learners, and students with mild and moderate disabilities. Across all studies, Odden et al. point to literature that supports full-day kindergarten programs; one-on-one tutoring services for struggling students; and student support and family outreach systems—all of which are intended to address the needs of this collection of special population students.

As the resource specifications of certain personnel are linked to the percentage of students in poverty, Odden, Fermanich, and Picus (2003, p.14) included students eligible for free or reduced price lunch, as opposed to solely free lunch, rationalizing that “our strategy for struggling students, by expanding the number of poverty students who are included, indirectly incorporates those [English as a Second Language] students who need extra help.” Moreover, in Wyoming an augmented duplicated count of “at-risk” students was used to generate resources that includes students eligible to receive free or reduced price lunch, English learners (who are not eligible for free and reduced price lunch), and mobile students (who are new to the school).

While the needs of students with moderate disabilities were presumed to be addressed by some of the strategies identified for low-income and English learners, students with severe disabilities were explicitly excluded from resource specifications for Kentucky, Arkansas, and Arizona.⁶¹ Moreover, in the Kentucky study, the consultants did not attempt to address instructional support programs for students with high incidence conditions like speech and language impairment, as

⁶¹ In Kentucky, the study authors referred to these students with severe disabilities as “low incidence,” and in Arizona, as “Group B” students, in alignment with the existing state special education funding formula.

they assumed these students as well as those with low-incidence disabilities (e.g. deaf or blind) would continue to be funded at the same levels as under the current state system.⁶²

In short, it appears that in response to the general lack of research evidence that could be used to guide cost-effective resource allocation practices for students in special education, this approach generally assumes that some percentage of special education students are like other “at risk” students and that their needs will be addressed by more general interventions such as kindergarten and supplemental one-on-one tutoring. However, where the line is drawn in regard to which special education needs can be expected to be served under these general remedies and those in need of supplemental intervention does not appear well defined. In a number of cases, the researchers indicate that “severe” special education students will need services beyond these general remedies. However, it is generally unclear how “severe” students are defined, and as special education students generally fall on a continuum of low to high severity in regard to their needs, how one would clearly draw the line between “severe” and all other special education students is not clearly established by the researchers and is not well defined in the research. In addition, in other places special education students with more mild disabilities are seen as beyond these general remedies, e.g., students needing speech therapy.

The default recommendation for the undefined number of special education students not adequately served by the general resource recommendations emanating from these studies is that they should continue to be funded by whatever method is currently used by the state. The “evidence” that is said to underlie the effectiveness of these extant funding approaches and the rationale for deeming them adequate are not clearly stated. In fact, it appears that the resource needs of many special education students are not fully considered in these studies in regard to their overall appropriateness or the full set of adequacy recommendations made by the research teams. It is hard to understand how the simple continuance of state funding practice for certain key classes of special education students, regardless of what these funding practices are, can be considered as either evidence-based or to have been determined through these studies as adequate.

What are the results for special populations under this approach?

Exhibit 3.4 shows the results that emerged from selected evidence-based studies for special populations. As mentioned, most of these results are in the form of general interventions for “struggling students” with some of the strategies cited in these evidence-based studies also being applicable to students with mild and moderate disabilities. For example, the Kentucky study did not specify any separate resources for mild and moderate special education students other than what was already provided for all struggling students (in addition, these students would continue to be funded as usual under the current state funding system).

In Arkansas, the authors proposed “adequate” staff to serve students with mild and moderate disabilities, and this was defined as 2.9 teachers for these students in a prototypical school enrolling 500 students. Interestingly, the professional judgment panels reviewing the proposed

⁶² As quoted, “To the degree possible, our analysis in the next section includes the resources for students with moderate needs, but excludes those children with severe disabilities and the speech impaired, which under the assumptions of our analysis would continue to be funded using the current system and funding levels” (Odden, Fermanich, & Picus, 2003:23)

results increased the original specifications from 2.0 to 2.9, a change that was ultimately supported by the overall committee collaborating with the consultants. However, there did not appear to be any rationale provided for this increase, nor was any offered regarding the initial level of 2.0 teachers.⁶³ It is unclear what research evidence is being drawn upon as the basis for recommending 2.9 supplemental teachers for students with mild and moderate disabilities for a school of 500 in one state and none in another. If this is simply the result of professional judgment as expressed by local educators and policy makers, it would seem appropriate to be more explicit on this point. The researchers also recommended that the Arkansas' catastrophic special education aid program for students with severe disabilities continue, but with a reduced threshold.⁶⁴

⁶³ The report notes simply, "After Arkansas Department of Education input, the Committee augmented the initial level of special education staffing from 2.0 to 2.9" (Odden, Picus, & Fermanich, 2003, p. 46).

⁶⁴ Specifically, the consultants noted, "An adequate approach would be for the state to reduce the expenditure threshold to about the new base expenditure level plus the amount the district receives for the student from Federal Title VI (b) funds, and to provide catastrophic funding for any expenditures above this amount" (Odden, Picus, & Fermanich, 2003, p. 27).

Exhibit 3.4. FTE Personnel Specifications for Special Needs Populations as Based on Selected Evidence-Based Studies

	Kentucky	Arkansas			Arizona			Wyoming <1>		
	Odden, Fermanich, & Picus (2003)	Odden, Picus, & Fermanich (2003)			Odden, Picus, Fermanich, & Goetz (2004)			Odden et al. (2005)		
School level	Elementary / Secondary	Elem	Middle	High	Elem	Middle	High	Elem	Middle	High
School size	500	500			500			288	315	630
% Special education		13.1%			12%			13%		
% Poverty (free / reduced price lunch)		47.4%			50%			30% <2>	28% <2>	22% <2>
% English learners		3.86%			25%			5%		
% Minority		28.8%			49%					
Teachers for struggling students <3>	1 for each 20% students from low income background with a minimum of 1 <4>	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 FTE teacher tutor for every 100 "at-risk" students: 1.2	1 FTE teacher tutor for every 100 "at-risk" students: 1.2	1 FTE teacher tutor for every 100 "at-risk" students: 2.4
Teachers for ELL students <3>	Reflected in the allocation of teachers for struggling students	Additional 0.4 teachers for every 100 ELL student who are also from a poverty family			Additional 0.4 teachers for every 100 ELL student who are also from a poverty family			An add'l 1.0 FTE teacher for every 100 ELL students: 0.15	An add'l 1.0 FTE teacher for every 100 ELL students: 0.16	An add'l 1.0 FTE teacher for every 100 ELL students: 0.32
Teachers for students with moderate disabilities/ speech / hearing (Referred to as Group A in AZ)	Reflected in the allocation of teachers for struggling students. Also continue with current state funding system.	2.9 teachers			Retain current state average weight of 0.16 (weight applied to the count of <u>all</u> students)			Retain the current 100% state reimbursement		
Severe Disabilities (Referred to as Group B in AZ)	Continue with current state funding system. Extra costs for all low incidence, high cost, severely disabled students should be fully borne by the state.	Keep current Catastrophic Program but reduce expenditure threshold to the base allocation. Also deduct Federal Title VI (b) funds in calculating catastrophic aid.			Retain current state special education weights for Group B special needs students			Retain the current 100% state reimbursement		
Pupil Support Staff	1-5 Positions for student /family support; 1 for each 25% students from low income background with a minimum of 1	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	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	1.0 FTE position for every 100 at-risk students: 1.2	1 for every 100 at-risk students plus 1.0 guidance counselor for every 250 students: 2.5 total	1 for every 100 at-risk students plus 1.0 guidance counselor for every 250 students: 5.0 total

<1> Recommendations for support for at-risk students not listed in this table included extended day program and summer school. Each of these programs would generate 0.25 teacher FTE positions for every 30 at-risk students.

<2> Wyoming also had separate "at-risk" rates that included students receiving free and reduced price lunch, English learners and unduplicated mobile students (students who are new to the school). The estimated proportion of at-risk students in the prototype schools was 40 percent at each school level.

<3> There is generally a minimum requirement of 1 teacher in each category for each school.

<4> The study authors state, "This allocation would cover the needs of students from low income backgrounds, students whose native language is not English and are learning English, and the learning disabled" (Odden, Fermanich, & Picus, 2003, p. 18).

As noted above, researchers using the evidence-base method generally did not attempt to delineate what constituted adequate resources for special education students. Instead, they called for the continuation of the existing state special education funding formulas (which in most cases, applied to severe and non-severe students alike). The recommendation from Odden et al. (2004) for students with non-severe disabilities in Arizona was to retain the same state funding weights (average weight of 0.16, which is applied to total enrollment⁶⁵). While the study acknowledged that the current system under-funds these types of students, the consultants stated their belief that the increase in the funding base for all students resulting from their analysis would resolve the existing funding deficit.⁶⁶ For special education students with severe needs, Odden et al. recommended the continuation of the existing state funding formula (which gave greater weights to high-need students⁶⁷), and proposed the creation of a catastrophic fund for very small school districts that would provide additional funds when the actual costs for such students exceeded 150 percent of funded reimbursements.

In the Kentucky study, the researchers noted the supplemental special education spending ratio of 0.90 from SEEP as evidence (see Chapter 2 of this report), and suggested that the current weight of 1.10 used to provide state special education funds in Kentucky was thereby appropriate. They further proposed that the extra costs for high-cost students with severe disabilities be covered fully by the state. In the most recent study completed for Wyoming, Odden et al. (2005) recommended that the state's 100 percent reimbursement for special education expenditures continue. In short, the overall adequacy recommendation for special education students under the evidence-base method as it has been applied to date, is whatever the state currently does to fund special education is appropriate and should be continued.

Regarding English learners and students in poverty, resources under this approach were generally allocated across three personnel categories: teachers for struggling students, teachers for English learners, and pupil support staff.⁶⁸ Support for struggling students is directly linked to the number of students in poverty, with every 100 students eligible to receive free and reduced price lunch generating 1 teaching position (recall, however, that this support is also intended for students with moderate disabilities). Under this configuration, prototypical schools with an enrollment of 500 (regardless of school level) would have between one and five teachers depending on poverty levels. Note that Wyoming's resources, however, are based on an augmented duplicated count of "at-risk" students (that includes students in poverty, English learners, and transitory/mobile students).

⁶⁵ A weight that is applied to all students – those in and not in special education – for the purpose of generating funds for special education is known as a "census" approach.

⁶⁶ Students in this weight category (Group A) includes those in programs for specific learning disability, emotional disability, mild mental retardation, remedial education, speech/language impairment, homebound, bilingual, preschool moderate delay, preschool speech/language delay, other health impairments, and gifted. The Group A weight under the Arizona's funding system for students in preschool programs is 0.45, 0.16 for grades K–8, and 0.11 for grades 9–12.

⁶⁷ Special education students that fall into Arizona's "Group B" are students with low-incidence disability. Weights range from 6.025 to 0.003, depending on the type of program these students are served. The excess cost is fully funded by the state.

⁶⁸ Recommendations for support for at-risk students in Wyoming included extended day programs and summer school. Each of these programs would generate 0.25 teacher FTE positions for every 30 at-risk students (Odden et al., 2005).

Referring to “best practices and experience” that show additional support is needed for students who are both EL and low income, the consultants recommended in Arkansas and Arizona that every 100 students who are both generate 0.4 teacher positions in addition to the 1.0 allocated for poverty alone. After consultations with the professional judgment panels, this allocation was increased from 0.4 to 1.0 in Wyoming, due to the costs associated with providing services to EL students. While pupil support staff are also allocated on the basis of poverty (1 position per every 100 students in poverty), middle and high schools in the Arkansas and Arizona school prototypes generate one and two additional positions, respectively. Middle and high schools in Wyoming each generate one additional pupil support position.

Successful Schools/Districts

The successful schools approach is a performance-oriented method in which researchers identify schools or districts within a state that are successful based on certain outcomes (e.g., aggregate performance on standardized tests, dropout rates, graduation rates) and estimate a base cost for these schools (or school districts) using their actual current basic expenditures. Intended to represent the cost of serving students with no special needs in districts with no special cost-related circumstances, the basic expenditures used in this approach generally exclude expenditures on programs for students in poverty, English learners, and special education students.⁶⁹ The rationale behind this approach is that these schools or districts provide direct evidence of the cost of achieving a given set of outcomes. If other schools are provided the same level of funding as those identified as successful (after accounting for differences in student characteristics), they too will have resources “adequate” to the realization of “success.” Exhibit 3.5 lists studies that have used this approach for measuring educational adequacy. A number of these studies have been done in conjunction with a professional judgment approach, as indicated in the exhibit below.

⁶⁹ Also excluded are expenditures for capital purposes, food services, transportation, any federally funded services, and adjustments for district characteristics, such as size or regional cost differences that are applied to a base cost figure in allocating state aid to school districts.

Exhibit 3.5: Studies that have used the successful schools approach

Colorado	Augenblick and Myers, Inc. (2003a)*
Connecticut	Augenblick, Palaich, Silverstein, Rose, & DeCesare (2005)*
Illinois	Augenblick and Myers, Inc. (2001a)
Kansas	Augenblick, Myers, Silverstein, and Barkis (2002)*
Maryland	Augenblick and Myers (2001b)*
Mississippi	Augenblick, Van de Waters, and Myers (1993)
Missouri	Augenblick, and Myers (2003b)*
New Hampshire	Augenblick, Myers, and Silverstein (1998)
New York	Standard and Poor's School Evaluation Service (2004)
Ohio	Augenblick and Myers, Inc. (1997)
South Dakota	Augenblick, Brown, DeCesare, Myers, & Silverstein (2006)*
Tennessee	Augenblick, Palaich & Associates, Inc. (2003b)*
Vermont	National Conference of State Legislatures (2004)
Washington	Fermanich, Picus, and Odden (2006; in progress)

* Successful schools approach was done in conjunction with the professional judgment method.

Each study typically has a different set of criteria in determining which schools should be labeled “successful.” For instance, Augenblick and Myers, in at least some of their studies, determine this by using the state’s educational standards, as defined by the current state legislation (e.g., Tennessee) or by a group of educators and/or legislators (e.g., Legislative Education Planning Committee for Kansas and the State Department of Education for Maryland). Sometimes they incorporate both techniques—a review of state legislation and a panel of education experts and legislators—to provide a tailored description (e.g., Colorado).

While this approach provides a direct link between educational spending and academic performance, its data requirements could lead to a selection bias, because any missing data will exclude a school or district from analysis. In addition, those using this method tend to drop outliers from the analysis, resulting in the exclusion of large urban districts, very rich and very poor districts, and sometimes, small rural districts. The districts included in these studies are likely to be smaller, with a homogenous student population, and to spend less relative to the statewide average (Picus, Odden, & Fermanich, 2003). Accordingly, the results may be inapplicable to districts that do not share similar characteristics with the successful districts, such as large districts with high proportions of special needs students or a diverse population. Hanushek (2005) argues that it is not possible to estimate from this information what underperforming schools should be spending to achieve the standards used in these studies. For example, if you identify schools that have not yet achieved 95 percent proficiency (which is the standard for NCLB), then you cannot extrapolate the cost of achieving 95 percent proficiency.

Another disadvantage to this method is the potential for the data to be misused or exploited. For instance, although researchers conducting this approach suggest the use of a weighted expenditure average of the districts considered successful, legislators have sometimes proposed

using just the bottom half of the data or the district with the lowest spending, which then drives the state-level base cost down (Odden, Fermanich, & Picus, 2003). Finally, while this approach identifies the amount successful schools in a particular state spend on average, it does not provide any information regarding *how* these schools are using their resources (Augenblick & Myers, 2003b).

How are special populations considered in this approach?

While this approach could perhaps in theory be used to examine the marginal costs, Augenblick and his colleagues note they did not estimate the additional costs necessary to adequately educate students with special needs (e.g., students in poverty, ELs, or special education students) because the required data were not available.⁷⁰ Acknowledging that the successful schools/districts approach does not provide marginal costs for special populations, these researchers in recent practice have addressed the needs of these students through the professional judgment component. The base cost estimates derived from the two approaches were then compared, with the idea that the bases represent two different standards. While the base from the successful schools/district approach represents current spending to ensure the success of “regular” students, the professional judgment base reflects “resources that panels of educators felt are necessary for districts of varying size to get ‘regular’ students to meet higher performance expectations” by some defined future point in time (Augenblick, 2006, p. 63).

It was generally recommended that the state use either figure as the base, or utilize the successful schools base as a floor (as it was consistently lower than the other) and the professional judgment base as the ceiling, to which the professional judgment weights for special populations can be applied in either case.⁷¹ Recall that the successful schools analysis excludes spending on special populations, and therefore estimates derived from this approach are intended to represent spending on students with no special needs. Applying the pupil weights (from the professional judgment approach) to a successful schools base should not in theory double-count resources intended for special populations in a given state. This, however, may not always be straightforward. For instance, Colorado uses a foundation formula that allows districts to supplement the foundation amount with limited local funding. Augenblick and Myers (2003a) acknowledge, “[T]o the extent that districts use such revenue to supplement state and federal support targeted for special needs, the use of foundation base funding and voter approved supplemental funds might overstate basic expenditures” (p. V-2-V-3).⁷²

In Illinois, Augenblick and Myers (2001a) explicitly focused on the proportion of at-risk students (defined as students eligible to receive free or reduced price lunch) when selecting successful districts in order to see how the base estimate changed with varying proportions of these

⁷⁰ Data required to conduct such an analysis, as identified by Augenblick and Myers (2003a; Missouri), includes FTE enrollment, supplemental spending for students with special needs by category of need, and indicators of the extent to which these students are meeting the state standards.

⁷¹ See Appendix C for a comparison of the bases yielded by these two approaches across the seven states and the study recommendations.

⁷² A similar caution was expressed in the Connecticut report, as the authors note, “Since spending for special needs students is not tracked by school districts, however, [we] may not have been able to remove completely all local or district revenues used to support those services” (Augenblick et al., 2005).

students.⁷³ The authors also conducted a regression analysis, separate from the successful schools approach, from which they inferred the amount spent on at-risk students.⁷⁴ Yet the successful schools/district approach as a stand-alone model, given the data limitations, is generally not considered well-suited for estimating additional costs for adequately educating special needs students. Instead, as noted by Baker (2006, p. 21), “arbitrary recommendations for marginal cost adjustments are attached to successful schools estimates after the fact.” For example, the Standard and Poor’s School Evaluation Service (2004), acknowledging that there was insufficient data to determine the additional cost of students with special need to reach a specified outcome in New York, referenced 37 articles and studies on school finance issues relating to these types of students to derive its pupil weights.⁷⁵ In short, it seems generally acknowledged that this approach is not well suited to the consideration of adequacy for special needs students, and is well short of what is needed to consider a complex question such as adequate resources needed for the vast array of student needs that fall within special education.

Cost Functions

A performance-oriented method, the cost function approach provides a systematic way to calculate the relationship between spending and educational outcomes, controlling for differences in student needs, district characteristics, and geographic variation in teacher compensation. In controlling for student- and district-level characteristics, this approach estimates the marginal impact of those characteristics on the expenditure needed to attain a certain outcome. See Exhibit 3.6 below for a list of studies using this approach.

Exhibit 3.6: Selected studies that have used the Cost Function Approach

Minnesota	Haveman (2004)
New York	Duncombe & Yinger (2005)
Texas	Reschovsky & Imazeki (2003)
Texas	Gronberg, Jansen, Taylor, & Booker (2005)

Note: The cost function approach is being currently implemented in California.

The cost function approach is a statistical approach to deriving adequacy estimates that relates measures of the output being produced to varying levels of inputs and local conditions. Cost function studies incorporate such variables as input prices, educational outcomes, and variations

⁷³ In selecting successful districts, the study examined all districts, those districts within one half of a standard deviation of the mean percent of at-risk pupils for each district type, those districts above one half standard deviation below the mean, and those districts above one half standard deviation above the mean.

⁷⁴ The authors used two approaches in conducting the regression analysis. The first approach yielded a constant weight of 0.44 per at-risk student to be applied to all districts, regardless of the proportion of at-risk students. In the second approach, the weight varied with the proportion of at-risk students. Note, however, that the regressions used spending across all districts – not just those categorized as “successful.” The authors note, “This approach does not speak to the issue of whether the expenditures for at-risk pupils produce performance results but...there is very little information available from any source that is capable of linking funding to performance in an unambiguous way” (Augenblick & Myers, 2001a:23).

⁷⁵ The weights for special education, economically disadvantaged, English learner students were 2.1, 1.35, and 1.2, respectively. The 2.1 weight for special education students represents an average across different disability types. While the study indicated that the individual student weights would vary by type of disability, it did not identify these specific weights.

in the student demographics into a statistical equation to produce “adequate” district-level cost estimates. To adjust input prices, researchers using this approach generally use indices that account for geographic variation in teacher labor costs across school districts or regions. These equations also generally include data on enrollment, indicators of student need (e.g., percentages of students eligible for free/reduced lunch, special education students, and English learners), and measures of efficiency.⁷⁶

Each coefficient estimated from the multivariate regression analysis represents a marginal effect defined as a percentage change in the expected per pupil expenditure due to an absolute percentage point change in the number of students in a given need category (e.g., the percentage of students identified as English learners). The coefficients can then be used to calculate district-specific pupil weights that denote the additional expenditure needed to educate students with a specific special need. As the percentages of students with special needs in a district increase, the expenditure necessary to provide an adequate education, as defined by some predetermined achievement level or other educational outcome, in that district increases commensurately.

A commonly cited strength is that it uses empirical data to examine the relationship between expenditures and school or district outcomes (Baker, 2006; Taylor et al., 2005). The fact that this technique can account for differences—the proportion of high-need pupils, district size, personnel wages, desired outcome levels, and economies of scale—adds to its appeal as a means for estimating educational adequacy. That being said, there are several limitations and drawbacks to the cost function approach. As with the successful schools approach, cost function analyses demand a large amount of data across districts, such that many states are not able to carry out this type of study. The number of outcome dimensions is also limited in scope, and the analysis can only include outcomes for which there is reliable data. Furthermore, statistical models used to estimate cost functions and their results are often complex and difficult to explain to policy makers and the public. In addition, there is often disagreement among researchers concerning assumptions made with regard to model specification and estimation technique and with regard to the outcomes and other variables included and how these are measured and used.⁷⁷

While cost function models depend on empirical data, the models become limited when projecting outside of the effective sample. For example, while model results can be used to project the *expected* cost of attaining a specified outcome for students with certain characteristics (e.g., special education or English learner students), in reality schools with extreme need characteristics exhibiting high levels of achievement often do not exist. This point is critical, as the outcome objectives established by the states for adequacy studies are generally well beyond the observed performance of most (or all) of the school districts within a state.

⁷⁶ To control for district efficiency, the authors state they have employed methods such as stochastic frontier cost models, data envelopment analysis, and less direct efficiency measures such as proxies for district competition for students using Herfindahl indices (Gronberg et al., 2004; Ruggiero, 2004; and Imazeki and Rechovsky, 2004, as cited in Baker, 2006).

⁷⁷ For example, it has been widely acknowledged that both the desired outcome levels and salary levels offered are both under the districts’ control (i.e., outcomes and salary levels are simultaneously determined or *endogenous* with respect to expenditure). Because this potential endogeneity may significantly bias model results, alternative estimation strategies (i.e., instrumental variables estimation) are often used, which necessitate additional assumptions and add complexity.

And lastly, although cost functions provide a way to estimate adequate total spending, the method lends little insight into how to best organize and allocate resources to achieve these means.

How are special populations considered in this approach?

As mentioned above, the cost function approach controls for student- and district-level characteristics, and in doing so, estimates the marginal impact of those characteristics on the cost of attaining a certain outcome (expressed as a coefficient). Virtually all these studies include the percentage of students in the district eligible for free and reduced-price lunch, receiving special education, and identified as English learners. There are variations in the measurements used to identify special education students in these studies. For example, Reschovsky and Imazeki (2003) differentiated between students with any type of disability and those with severe disabilities, thereby producing two different coefficients.⁷⁸ Similarly, Gronberg and his team of analysts (2005) distinguished between special education students who have less severe and severe needs.⁷⁹

Although quite different in its overall approach to the question of education adequacy, this approach shares with the professional judgment approach the ability to fully consider in an aggregative sense the full range and mix of students with special needs in a district. On the other hand, it seems ill-suited to the consideration of special education adequacy in any detailed way or in producing overall cost estimates of adequate special education costs.

What are the results for special populations under this approach?

Exhibit 3.7 presents the estimated coefficients and pupil weights from three such studies (Reschovsky & Imazeki, 2003; Duncombe & Yinger, 2005; and, Gronberg et al., 2005). We discuss only the statistically significant results below. As mentioned above, it is important to note that special needs are treated in a variety of ways across the three studies, which have implications on the resulting estimates. As shown in Exhibit 3.7, the statistically significant effects of the proportion of special education students with non-severe disabilities ranges from 0.291 to 0.653, suggesting that a 1 percent increase in the identification rate for these types of students is expected to increase per pupil expenditure in the average district from approximately .29 to .65 percent. The estimated effect of the proportion of students with severe disabilities is generally much higher, ranging from 0.592 to 0.867. Making no distinction between severity in student need, Duncombe and Yinger's (2005) estimated coefficients for special education of 1.776 and 1.955, which are larger than those calculated by Gronberg et al. (2005) for students with severe disabilities.⁸⁰

In addition to coefficients, Duncombe and Yinger (2005) generated a pupil weight for each district in New York. As with the weights presented in the professional judgment approach section, the weights are applied to the base spending for students with no special needs. For instance, the special education weight of 2.64 derived from Model 2 suggests that the expected

⁷⁸ Reschovsky and Imazeki (2003) defined severe disabilities as autism, deafness, and deaf-blindness.

⁷⁹ Gronberg et al. (2005) defined less severe disabilities as learning or speech disabilities (with no additional disability) and severe disabilities as disabilities other than learning or speech disabilities.

⁸⁰ The range of effects for English language learners spans from 0.126 to 0.991, while for at-risk students, it is 0.205 to 1.307.

additional cost of providing an adequate education to a special education student is 2.64 times the cost of a student with no special needs. As observed in Exhibit 3.7, the authors calculate similar weights ranging from 1.00 to 1.42 for English learners and 1.11 to 2.15 for students in poverty.

Exhibit 3.7. Estimation Results for Special Needs Populations Based on Selected Cost Function Studies

State	Study	Special Education Coefficients <1>	Severe Disability Coefficients <2>	English Learner Coefficients	At-Risk/Poverty Coefficients	Special Education Weights <3>	English Learner Weights <3>	At-Risk/Poverty Weights <3>	Additional notes
TX	Reschovsky & Imazeki (2003)	0.020	3.580	0.410**	0.120				Model 1) With efficiency index included
		0.550	9.430	0.660**	0.570**				Model 2) Without efficiency index included
		0.549**	0.825**	0.192**	0.282**				Model 1) Baseline
		0.550**	0.790**	0.186**	0.292**				Model 2) Expenditure omits operating costs
		0.556**	0.818**	0.220**	0.248**				Model 3) Broader poverty measure (based on receipt of free or reduced lunch)
		0.291**	0.592**	0.199**	0.255**				Model 4) Predicted rather than actual wages used
TX	Gronberg, Jansen, Taylor, & Booker (2005)	0.653**	-0.181	0.126**	0.205**				Model 5) Restricted functional form of model that constrains all quadratic and cubic terms except for those on enrollment
		0.547**	0.759**	0.194**	0.269**				Model 6) Does not assume frontier errors to account for variation in efficiency
		0.497**	0.867**	0.196**	0.244**				Model 7) More stringent outcome criteria that uses change in (value-added) percent passing <u>both</u> math and reading.
		0.500**	0.162	0.162**	0.266**				Model 8) Limits outcome to change in (value-added) average pass rates for just economically disadvantaged students.
		0.653**	0.588	0.164**	0.336**				Model 9) Explores impact of district size by limited sample to districts with less than 1,600 students.
		0.506**	0.860**	0.225**	0.240**				Model 10) Refined model that is a combination of 3) and 7).
NY	Duncombe & Yinger (2005)			0.998**	1.307**		1.007 ^a	1.415 ^a	Model 1) Census poverty
							1.030 ^a	1.419 ^a	
							1.308	1.667**	
		1.955**		0.991**	1.142**	2.049 ^a	1.009 ^a	1.224 ^a	Model 2) Census poverty with special education
						2.081 ^a	1.033 ^a	1.281 ^a	
					0.982**	2.644**	1.424*	1.592**	
							1.108 ^a	Model 3) Free/reduced lunch	
							1.294 ^a		
							1.690**		
		1.776**			1.126**	1.853 ^a	1.361 ^a	Model 4) Free/reduced lunch with special education	
						1.880 ^a	1.552 ^a		
						3.016	2.145*		

<1> The results in this column for Gronberg et al., (2005) represent the effects of students with non-severe disabilities (e.g., learning or speech disabilities and no additional disability). All other results in this column make no distinction between severity of need.

<2> Reschovsky & Imazeki (2003) identify severe disabilities as autism, deafness, and deaf-blindness. Gronberg et al. (2005) define severe disabilities as those other than learning or speech disabilities.

<3> Duncombe & Yinger (2005) present three pupil weights based on 1) a simple average; 2) an enrollment-weighted average; and 3) a directly estimated weight.

** indicates significance at the 1%-level; * indicates significance at the 5%-level.

^a No standard error or t-statistic reported.

Conclusion

This chapter has presented an overview and analysis of existing techniques that have been used for estimating the cost of an adequate education with an emphasis on special education. It delineated these studies under the four primary modes of addressing adequacy – professional judgment, evidence-based, successful schools, and cost function approaches – and outlined the results of these studies as they relate to students with special needs. We have specifically focused on the degree to which these various approaches to education adequacy, as well as the individual studies, have been able to fully incorporate and consider the full range of special education needs. By reviewing the record of how these approaches have been applied, we have been able to further consider the capacity of each approach to address the question of adequate special education provision.

Special education services are especially difficult to incorporate within an adequacy perspective. Adequacy focuses on defining the quantity of resources needed for a given group of students to achieve a specified level of education outcomes or results. While no methodology for unambiguously addressing this question exists, the question is especially complex for those receiving special education services. For example, it is known that some percentage of special education students cannot be expected to reach the kinds of academic standards underlying adequacy considerations regardless of the amount of resources allocated. For example, most severely cognitively impaired children can not be expected to reach academic expectations like passing the New York Regency Examination regardless of the quantities of resources invested in their education. At the same time, it can not be known precisely for which students these expectations are realistic – for the vast majority of students in special education the outcome standards set for all children are appropriate.

Special education is also complex within an adequacy framework because of the difficulties and issues associated with uniform identification and labeling. Generally unlike students in poverty or those who are English learners, the overall percentage of students identified as special education may or may not be a solid indicator of varying student need. For example, if at one school 60 percent of its students qualify for free and reduced lunch as compared to 40 percent in another school, it is generally accepted that the varying degree of needs in regard to poverty are reasonably well understood. In the case of special education, however, if one school has 12 percent of its students identified as being eligible for special education services and another only 8 percent, it is not clear that the true disability-related needs of one school are greater than the other. That is, ambiguity in how students with mild learning difficulties are identified and should be served confounds an understanding of how variations in the overall percentage of students identified for these services relate to overall student need.

Beyond this, the mix of severity within the general population of special education students will certainly affect the degree of supplemental resources needed at a given school. However, some of the adequacy studies listed above do not attempt to differentiate between students with mild versus severe disabilities, nor is there always an easy way to measure these severity differences from available data. Category of disability is generally the most useful method available from extant data for distinguishing relative severity of a given special education student population,

but it is known that there is often a great deal of variation within these individual categories and in how students with varying conditions are assigned to them across districts and states.

Thus, the consideration of adequacy is arguably a more complex undertaking than for other categories of students, including other categories of students with special needs. The research provides very little hard evidence on the efficacy of one set or level of resources over another in addressing the needs of special education students in the most cost-effective way to enable them to attain a given set of outcomes. For this reason, it is not surprising that education adequacy approaches that claim their answers are based on evidence or existing research have relatively little to offer in regard to special education adequacy. As noted above, to a large extent, the practitioners of the “evidence-based” approach seem to have conceded this inability to address special education needs by simply advising states to carry on with whatever they are currently doing. This is particularly problematic when state funding comprises only a small share of the overall special education expenditures; for instance, in Arizona, the reported state share of special education expenditures is just five percent, with federal and local revenue picking up the rest (Parrish, Harr, Wolman, Anthony, Merickel, & Ersu, 2004).⁸¹ Recommending that the state funding system continue in this case does little to answer what levels of provision are adequate for special education students to reach a specified outcome.

The successful schools approach also can be seen as largely defaulting in regard to the needs of special populations and is especially poorly equipped to consider the complex array of needs falling under the category of special education. As noted, these studies have generally incorporated a professional judgment component to supplement their basic findings to include measures of special education adequacy.

The professional judgment and cost function approaches both involve methods for including special education students in their adequacy calculations. While neither provides a perfect answer to the overall adequacy question, both attempt to incorporate the special education population in its entirety and to acknowledge that special education is simply one more element in a mix of factors that determine overall adequacy costs in ways that are both direct and interactive.

However, neither approach is especially well suited to providing detail in regard to special education adequacy. Expenditure analyses such as SEEP as presented in Chapter 2, and to a lesser extent the California Incidence Study as mentioned in Chapter 1, provide much more detailed information in regard to special education spending. Arguably they also provide a perspective on special education costs as discussed in Chapters 1 and 2 that could be used in conjunction with some of the more mainstream adequacy approaches to more clearly define and address the question of adequate special education spending. Using expenditure estimates based on actual service provision does not reproduce the same drawbacks as studies that simply recommend the continuation of state funding systems. For one, no rationale in these studies is given on whether the state funds are adequate for the current level of special education expenditures. As special education is often funded through a combination of federal, state, and local revenues, recommending the continuation of state funding does not address in any meaningful way the question of adequacy. Adequacy approaches that consider and/or reflect the

⁸¹ Kentucky did not report on the share of special education expenditures.

full expenditure on special education services (from all funding sources) provide a more reasonable basis for considering this question.

Summarizing the four traditional approaches to the consideration of education adequacy, Exhibit 3.8 lists some of the strengths and weaknesses of each in regard to special education. As shown, and described above, the evidence based and successful schools approaches have relatively little to offer in regard to the consideration of special education adequacy based on the criteria shown below. The professional judgment and cost function approaches both explicitly consider special education. The latter approach attempts to statistically observe the impact of the percentage of students in special education (or in some studies, percentages by severe and non-severe categories of disability), along with a number of other variables to estimate the marginal cost of students in each district realizing a specified outcome standard. This presents a more positive analysis of special education costs as compared to the more normative standard emanating from professional judgment. The econometric approach asks, given circumstances as we can currently measure them – the percentage of students in special education and the way they are currently served – what appears to be the marginal cost of reaching a certain outcome standard? Professional judgment, on the other hand, attempts to derive a more normative standard. This approach seeks professional judgment regarding what would be needed for special education students to reach a specified outcome standard if general education services were fully adequate, if students were served appropriately in regard to such factors as the least restrictive environment, and if other programs that may affect these services were in place, e.g., pre-school and other alternative preventative and remedial services.

Exhibit 3.8: Criteria for evaluating approaches for measuring educational adequacy for special education students

	Professional Judgment	Evidence-Based	Successful Schools	Cost Function
Explicitly includes special education students	✓	Weak	—	✓
Identifies marginal cost of special education	✓	—	—	✓
Addresses variation in student characteristics (e.g., severity)	✓	Weak	—	✓
Address economies of scale in special education	✓	—	—	✓
Incorporates services that may affect the need for SE, e.g. pre-school or remedial services	✓	✓	—	—
Considers special and general education adequacy together	✓	Weak	—	✓
Incorporates consideration of “best practice”	✓	✓	—	—

Thus, among the four traditional approaches to adequacy, only the professional judgment and cost function methodologies conceptually incorporate the consideration of special education students to identify the marginal costs of these students meeting a certain outcome. As described above, the approach these two methodologies take to this question are quite different. Due to the

general lack of understanding about the education production function, i.e., the mix of resources and/or services that lead to specified educational outcomes, neither of these approaches can be said to produce special education adequacy estimates that can lead to specified outcomes with a high degree of confidence.

Chapter 4: Special Education Spending/Cost Estimates for California

The second research question posed for this study asks how existing approaches might be used to estimate the cost of an adequate education for special education students in California, and how these cost estimates compare to what is currently spent on special education students. As discussed in Chapters 1 and 3, the data currently available as measures of spending have important limitations, as do currently known approaches to measuring adequacy in special education. Two approaches to deriving an overall adequacy cost estimate for the state, all of which include special education in one form or another, are currently being completed in conjunction with the overall adequacy project of which this paper is also a part. Please refer to Chambers, Levin, and Delancey (forthcoming), Sonstelie and Lipscomb (forthcoming), and Imazeki (forthcoming) for the results from these studies.

The three studies listed above will include special education in some form as a part of the larger consideration of special education adequacy in the state. The degree to which they will be able to uniquely focus on special education adequacy remains unclear, as well as whether they will produce a stand alone estimate of special education adequacy in California. This chapter presents four alternative ways of conceptualizing, measuring, and comparing a continuum of expenditure/cost estimates that are limited just to special education services in California.

As an example of why we consider this a continuum, one of the major data points across that we include is derived through a prior AIR study conducted for the California Department of Education concerning variations in special education severity across the state. While the data developed for that study do provide a reflection of special education spending in districts across the state, at least one of the ongoing adequacy studies referenced above (e.g., Sonstelie & Lipscomb) is using these data as the basis for the special education adequacy component.

As evident by Sonstelie and Lipscomb's use of these special education expenditure data in his adequacy study and as argued in Chapter 1, for special education we believe the distinction between spending and cost to be less clear than for other education programs. What is spent in special education is the result of clear deliberations of a team of education and other professionals regarding what each special education child needs to achieve a specified level of education outcomes. While these outcomes are not always completely uniform for all special education students, this condition also can not be met for all special education students under any approach to adequacy, as it is commonly accepted that general state performance goals may be inappropriate for some subset of special education students. But in the current era of enhanced and clearly specified state and federal standards for all students, it is likely that the individualized education programs (IEP) prescribed for most special education students specify the educational programming and supplemental services deemed necessary for them to meet the prevailing expected outcome standard.

For the relative minority of special education students for whom this more uniform outcome goal is not appropriate, the committee is required by law to specify those educational programs and services needed to meet educational goals that are appropriate for them. Although the IEP committee members may feel some cost constraints in prescribing what is needed to meet these educational goals for individual special education children, this may be true of all of the other adequacy methodologies as well. Again, however, the law states that cost can not be used as a reason for withholding a service that is needed to meet the outcomes goals specified in the IEP.

Thus, while we present in this chapter a continuum ranging from estimates of current special education spending to cost estimates designed to approximate adequacy, we believe that this distinction across these varying measures for special education remains less clear than is normally the case. We do not argue that any of these necessarily constitutes a more precise answer to the question of special education adequacy than another. While each has advantages and disadvantages, we believe strength is added through the following analysis of the varying perspectives presented in this chapter.

With that in mind, a brief review of the shortcomings of these approaches is worthy. Some of the following estimates rely upon data by disability category (e.g., spending ratios and counts by disability). As mentioned in Chapter 2, disability categories may not be an accurate reflection of student need, given the variation we observe in spending *within* the same category. Perhaps a more appropriate alternative to using disability categories is information on students' functional characteristics, such as the ABILITIES Index (see Chapter 2); however, such data are not available for special education students in California. In absence of information on functional abilities, educational placements (e.g., percentage of time outside the regular education classroom) might be a better proxy measure of student need. Although SEEP provides spending estimates by educational placement, we did not obtain counts of students by placement categories by school from the California Department of Education.

Another concern is the fact that students with disabilities presently perform below the expected AYP targets in ELA and math. One might argue that this is evidence that the current services provided to these students are inadequate for meeting current federal standards, and especially inadequate for meeting higher levels of proficiency as required by 2007-08 (e.g., 34 percent) or the 100 percent proficiency expected by 2013-14. Accordingly, the estimates presented here should be considered conservative, lower bound estimates of special education adequacy.

In addition, with the exception of the actual spending estimates derived from state data, the estimates do not reflect economies of scale that may result from serving larger numbers of special education students, particularly those with severe needs. For instance, the alternative approaches apply the same cost estimates to a district with 1 student with autism as to a district with 50 students with autism.

Lastly, the estimates presented in this chapter are for special education spending only. The approaches do not say anything about what is an adequate mix of both general and special education services for special education students – only what might be considered adequate spending for special education services. Ideally, special education should not be considered in isolation, but rather within the context of adequacy for all children. As will be shown further,

many special education students also receive general education services, and we know that a high percentage of special education students spend the majority of their school day in regular classrooms.⁸² If adequacy requires an enhanced general education program for all students, it will likely have implications for the special education program for students with disabilities. As general education is bolstered for all students within the context of adequacy and accountability, the need for special education services for many students may decrease.⁸³

On the other hand, most state adequacy studies appear to be driven by questions of what should be the state's funding obligation. In most cases, state funding for special education is determined and distributed separately. In this respect, isolating the special education component is a reasonable task for this study. In addition, the available data do not track general education services provided to special education students in California, thereby limiting our ability to analyze current total spending on special education students. Examining special education alone allows us to make comparisons between current special education spending levels and alternative estimates. Although this report presents special education spending figures, we would like to emphasize the need to consider special education adequacy within the framework of general education.

The first section of this chapter describes the approaches taken in deriving four alternative estimates of special education spending/cost in California. The second section shows comparisons of the results from these four sets of estimates per special education student statewide, as well as how these estimates vary across different types of districts in the state. The chapter concludes with a brief discussion of how these findings may be interpreted within the overall context of attempting to define special education adequacy for California.

Methods Used for Deriving Alternative Estimates Special Education Spending/Cost

To derive alternative estimates, we drew upon four primary data sources:

- District-level Standardized Account Code Structure (SACS)
- Prior AIR work conducted for the *Study of the Incidence Adjustment in the Special Education Funding Model* (Parrish et al, 2003)
- Spending ratios from the national Special Education Spending Project (SEEP)
- District-level counts of school-aged (ages 5 or older) special education students by disability category provided by the California Department of Education (December 2004 child count).

In all cases, we either had available or derived these expenditure/cost estimates at the individual district level. While we could have simply made statewide calculations for the purposes of this report, we also wanted to show how these varying approaches to estimating special education

⁸² We acknowledge, however, that this does not preclude the provision of special education services, as they may be provided in the regular classroom.

⁸³ For instance, the highly qualified teacher requirements of the NCLB may result in more students with disabilities being educated within the general education setting, with little or no special education services.

spending/costs vary by district size and type. These sub-analyses are sometimes informative in understanding some of the strengths and weaknesses of these alternative approaches.

Estimates from the Standardized Account Code Structure (SACS)

The California *Education Code* (Section 41010) requires local educational agencies (LEAs) to follow standardized accounting procedures for reporting education revenues and expenditures. As of the 2003-04 school year, all LEAs were required to use the Standardized Account Cost Structure (SACS).⁸⁴ SACS provides annual revenue and expenditure figures for all school districts in California. Expenditures are disaggregated into certified salaries, non-certified salaries, employee benefits, books and supplies, services and other operating expenses, capital outlay, and other outgoing expenses such a tuition to other districts.⁸⁵

This study made use of the most recent version of the SACS data (2004-05). Drawing upon the framework developed in Sonstelie and Lipscomb (forthcoming) that identified expenditures using combinations function and object codes, the following eight categories were created:⁸⁶

1. General Education
2. Instructional Materials
3. Special Education
4. District Administration
5. Pupil Transportation
6. Maintenance & Operations
7. Professional Development
8. Miscellaneous

This information was used to calculate total educational expenditures for each district in the state. In order to isolate special education expenditures, special education goals were cross-referenced with the expenditure line items under each of the categories above and then aggregated accordingly. To ensure comparability with the other alternative estimates, we excluded maintenance and operations expenditures associated with special education goals.

Along a continuum of expenditures to costs, SACS provides the purest special education spending data available for the state. There is clearly an advantage with these data in that they come from an accounting framework and approach to estimating education program spending and are used as the official statewide special education expenditure. Accounting-based measures of total spending by program areas, such as special education, benefit from the consistent application of accounting rules and conventions regarding what should be counted, and what not, in one category of expenditure in relation to another.

On the other hand, Levin and McEwan (2001) point out a number of limitations to estimates derived from these types of expenditure files. For example, they note that some of the expenditures associated with a given program or intervention are likely to be embedded in much

⁸⁴ The manual for the 2004-05 Standardized Account Cost Structure is available for download online at the California Department of Education website at: <http://www.cde.ca.gov/fg/ac/sa/documents/csam2005complete.pdf>.

⁸⁵ See Appendix D for information contained in SACS.

⁸⁶ The framework furthermore coded expenditures within each of these categories (except for Category 3 – Instructional Materials and Supplies) into personnel and non-personnel.

larger categories of spending, e.g., district administration, and that breaking these out in an attempt to determine full spending on a program like special education can be difficult. As a result, they conclude that “expenditure documents ... cannot serve as a principal source of constructing cost estimates” (Levin & McEwan, 2001, p. 46).

Although it can be argued that our use of SACS in this chapter is to derive a measure of spending, rather than cost per se, and even though SACS has uniform rules regarding how various expenditures (e.g., administration) are associated with individual programs (e.g., special education), analyses of these data suggest possible problems in their reliability and consistency. It also should be noted that SACS is relatively new to the state and therefore is likely still undergoing refinement in regard to the application of its many accounting rules.

For example, dividing the special education district expenditure amount derived from SACS by its special education enrollment (from a separate data source) shows that spending per special education student ranges from \$169 to \$222,522. While extreme, this range may be explainable to a degree. For instance, in the higher end example, the district in question has a total enrollment of less than 160 students and is serving a single special education student, whose disability is autism. While this falls outside the range of total spending on students with this disability presented in Exhibit 2.3 from SEEP, this district may face extenuating circumstances given its small size and minuscule special education population. On the other end, over two-thirds of the special education students in the lowest spending district have speech/language impairment or a specific learning disability – the two least expensive disabilities, on average, according to SEEP. However, this district also serves four students with autism, and its total per pupil expenditure of \$798 (e.g., all services for all students) is well-below the average \$7,245 across the districts analyzed in this study, which raises questions about the accuracy of SACS for this district. While there are clearly concerns with data emanating from the other approaches as well, it is important to note that SACS may at least equally problematic and should not necessarily be considered as the “gold standard” in regard to special education spending across the state against which the other measures presented in this report should be contrasted and compared.

In addition, SACS does not provide the kinds of detailed information that one might want to fully consider special education adequacy comparisons, e.g., it can not be used to produce data on average spending by special education categories of disability. These are among the reasons why we turned to an alternative measure of special education spending for the state as the second point of comparison for this report.

Estimates from the *Study of the Incidence Adjustment*

Just prior to the requirement that all districts use SACS, AIR completed the second of two studies conducted for the California Department of Education to examine the incidence of students with severe disabilities across the state (Parrish et al., 2003). The main purpose of these studies was to examine the incidence and distribution of “severe and/or high cost” students in districts across the state to see if some districts are much more heavily impacted by special education severity than others. Both of these studies found that severity did not appear to be randomly distributed across the state and recommended adjustments to the state’s special education funding formula to reflect these variations in special education student needs and their resulting costs.

As no unambiguous measure of the relative severity of a given special education student's condition exists in statewide data, AIR attempted to identify severe/and or high cost students through the use of individual student special cost estimates based on standardized salary and special education data from the California Special Education Management Information Systems (CASEMIS). While CASEMIS itself does not provide cost information per se, it does contain information regarding the special education services received by each special education student in the state.

Starting with the CASEMIS service information, AIR derived a cost for each type of special education instructional program and related service included in this database. This was done by multiplying the statewide number of personnel providing a particular service by a standardized salary, and then dividing this total by the count of students receiving the program or service as recorded in CASEMIS.

This resulted in a standardized cost estimate per pupil for each of the special education instructional approaches and/or related services recorded for a given pupil in CASEMIS. By simply adding the cost of all the services shown for a given student on CASEMIS, we were able to derive a standardized special education spending estimate for the state's full population of special education students as included in CASEMIS. As CASEMIS also contained information on each student's category of disability, it was possible to generate a statewide estimate of average special education spending per student by category of disability.⁸⁷

As we were not able to obtain the current CASEMIS data for the purpose of the present study, we adjusted these estimates from this prior study to produce the updated special education spending estimates shown in Exhibit 4.1.⁸⁸ The average expenditure by disability category for public school-age students in 2004-05 dollars ranges from \$5,841 for a student with a specific learning disability to \$35,789 for a student with autism. To derive estimates of special education spending by district, we applied the estimates of average spending shown in Exhibit 4.1 to counts of students (2004-05) by disability category by district.⁸⁹ The sum of expenditures across all disabilities in a particular district represents the spending level that could be expected if all districts in California had the standard level of special education provision presented in this exhibit.⁹⁰ In this sense, the resulting data are more reflective of standardized costs than actual

⁸⁷ While the description provided here of the approach used by Parrish et al. (2003) is fairly simple, it involved a complex process with multiple datasets and collaboration with an advisory panel to deliberate appropriate personnel-student ratios by category of disability and educational setting. For a detailed review of the methodology and its caveats, the reader should refer to the full report, which can be downloaded at: <http://www.cde.ca.gov/fg/fr/se/>.

⁸⁸ It is important to note that the spending estimates presented in Appendix H of the Parrish et al. (2003) report *exclude* a certain category of revenue called "revenue limits" from cost estimates for students served in special day classes or non-public schools. Therefore, the figures in that report under-estimate the true spending levels. For this study, we generated the full estimate by disability category inclusive of the revenue limits.

⁸⁹ The Special Education Division of the California Department of Education provided the study team school-level counts by disability category, which were aggregated to the district of service.

⁹⁰ Please note that while preschoolers are included in the average cost estimates shown in Exhibit 4.1 as derived from the prior Incidence Report, they are not included in the analysis for this study as the counts of special education students provided us by CDE included school-aged students only. In addition, as the students included in the special education count file are clearly those served within the state, we used the in-state NPS cost estimate for these students. As there was no clear variable to identify NPS students in this dataset, we treated CDS school codes that

district spending. We acknowledge that these estimates are averages, and mask substantial variation that might be expected by disability category (see Exhibit 2.3 in Chapter 2 for variations in *total* spending by disability).

Exhibit 4.1. Special education spending estimates from the *Study of the Incidence Adjustment in the Special Education Funding Model* (Parrish et al., 2003), adjusted to 2004-05 dollars

Disability	2001-02 Expenditure Estimates Adjusted to 2004-05*
Public School-Aged Students by Disability Category	
Autism (AUT)	\$35,789
Deafness (DEAF)	\$29,137
Deaf-Blindness (DB)	\$49,249
Emotional Disturbance (ED)	\$15,980
Established Medical Disability (EMD)	\$7,495
Hard of Hearing (HH)	\$17,292
Mental Retardation (MR)	\$16,202
Multiple Disability (MD)	\$28,850
Orthopedic Impairment (OI)	\$22,165
Other Health Impairment (OHI)	\$8,033
Specific Learning Disability (SLD)	\$5,841
Speech or Language Impairment (SLI)	\$6,440
Traumatic Brain Injury (TBI)	\$20,465
Visual Impairment (VI)	\$24,659
Preschool	\$11,979
Nonpublic School Students in-state	\$33,102
Nonpublic School Students out-of-state	\$38,609

* These estimates are inclusive of revenue limits that were originally excluded from the figures presented in the Parrish et al. (2003) report. In addition, the Education Cost Index (ECI) was used to adjust the 2001-02 figures to 2004-05 dollars.

SEEP Approaches to Estimating “Adequate” Special Education Spending

As described in Chapter 2, findings from the national (SEEP) provide another benchmark by which to measure special education spending/costs. As mentioned, SEEP generated a series of ratios of full spending for the average special education student relative to that for a student with no special needs. Exhibit 4.2 shows these ratios by disability category, as well as the average percentage of spending per special education student by disability category on special education services. This reflects the fact that most special education students also receive general education services, which contribute to the overall spending amounts. For example, the average total expenditure for a student with autism (including both general and special education services) is 2.9 times as much as the amount spent on a student with no special needs. Approximately 81 percent of this total is spent on special education services.

were not standardized numbers as representing nonpublic schools. The sum of NPS students in the analyzed districts using this approach (n=10,482) was fairly similar to the count of NPS students (n=9,547) reported in Parrish et al. (2003) in 2001-02.

Exhibit 4.2. Ratios of Total Spending on Special Education Students to Spending on Students with No Special Needs and Percentage of Total Spending Attributed to Special Education by Disability Category (from SEEP)

Disability Category	SEEP Spending Ratio*	% of Total Spending Attributed to SE
A	B	C
Autism (AUT)	2.9	81%
Emotional Disturbance	2.2	70%
Hearing Impairment/Deafness (HI/D)	2.4	69%
Mental Retardation (MR)	2.3	76%
Multiple Disabilities (MD)	3.1	80%
Orthopedic Impairment (OI)	2.3	73%
Other Health Impairment (OHI)	2.0	66%
Specific Learning Disability (SLD)	1.6	52%
Speech/Language Impairment (SLI)	1.7	58%
Traumatic Brain Injury (TBI)	2.5	75%
Visual Impairment/Blindness (VI/B)	2.9	73%
Students Placed in Non-Public Schools (NPS)	3.9	100%
Average Special Education Student	1.9	65%

* Note that these ratios represent the full expenditure on special education students. The weights derived from adequacy studies in Exhibits 3.2. and 3.7 in Chapter 3 reflect the add-on costs for special education students. To compare spending ratios to the weights, subtract 1 from the ratios above (e.g., 0.9 for the average special education student).

To derive a SEEP-based estimate of the cost of special education services in California, the data above could be applied to a base estimate for each California district reflecting their spending on a student with no special needs. First, the ratios in Column B above would be applied to this base to produce estimates of the total average cost per student by category of disability per district. The special education component of these total costs then can be estimated by applying the percentages in column C. The ensuing figures can then be multiplied by the counts of students in each disability category in each district in California. Aggregating these spending amounts across all disability categories provides a total special education cost estimate by district, i.e., spending that would be expected given the district's mix of students by category of disability, if it provided supplemental special education services proportionate to that found on average across the nation.

To use autism as an example again, let us assume that the base (i.e., for a student with no special needs) in District A is \$6,000. Applying the 2.9 ratio, we estimate the total cost of an autistic student in this district at \$17,400, of which \$14,094 (or 81 percent) is for special education services. If the district has seven students with autism, the total special education expenditure for those students would be \$98,658. Combining this amount with the totals for all of the other categories of disability by district and then dividing by the district's special education enrollment yields a SEEP-based estimate of the overall cost of special education services per special education student per district.

The biggest challenge in applying this approach to the derivation of an average special education cost estimate for the state is in identifying an appropriate base that is conceptually equivalent to the SEEP-calculated spending estimate for a student with no special needs (i.e., \$6,556 in 1999-2000). While California participated in the national SEEP study, the sample of California

students is not sufficient to calculate state-specific estimates. Also, as we want district-level estimates to allow sub-analyses by district type, we would prefer a base that reflects in some way local cost variations. As the base amount used will be critical to the resulting estimates, we have attempted one base that is much more closely linked to actual general education spending in the state and a second that is derived from adequacy deliberations. As a result, we have estimated two “bases” unique to each district in the state and applied them as Approach A and B using the same general approach described above.⁹¹

Approach A: Applying SEEP Ratios to a SACS Derived Base

As we lack information specific to California on spending on a student with no special needs, one alternative for deriving this is to compare the SEEP estimate for this type of student for 1999-00 to the national average per pupil expenditure for that year.⁹² The National Center for Educational Statistics (NCES) reported this national figure to be \$6,912 in 1999-2000. Comparing this to the SEEP estimate of spending on a student with no special needs of \$6,556 produces a percentage of 94.8 percent. That is, the SEEP estimate of total education spending for a student receiving no supplemental services in 1999-00 of \$6,556 equals 94.8 percent of the average expenditure per pupil for that year counting all supplemental services (\$6,912). By applying this percentage to the total expenditure per pupil for 2004-05 from SACS in each district,⁹³ we can derive estimates of current spending by district in California for the average student receiving no supplemental services. Across the districts analyzed with this approach (n=823), the average “base” (e.g., 94.8 percent of total expenditures) was \$6,868.⁹⁴

This approach reflects an estimate of current spending per student receiving no supplemental services in each district, which then can be used to derive an estimated special education cost per student as described above. An alternate estimate can be derived by applying a base derived from an adequacy analysis to the SEEP ratios. Approach B below describes this second approach to deriving a SEEP-based special education cost estimate for the state.

Approach B: Applying SEEP Ratios to Base Derived from Professional Judgment

In a separate study of adequacy across all education programming in California conducted at the same time as this special education study, Chambers et al. (forthcoming) are using the professional judgment approach to estimate the cost of the resources required for students to meet state and federal educational standards. While adequate resources were determined using this method for prototype schools which served regular education students as well as a range of

⁹¹ Both bases estimated from the approaches include district administration and transportation expenditures.

⁹² Table 167. Current expenditures per pupil in fall enrollment in public elementary and secondary schools, by state or jurisdiction: Selected years, 1969-70 to 2001-02. SOURCE: U.S. Department of Education, National Center for Education Statistics, Statistics of State School Systems, 1969-70; Revenues and Expenditures for Public Elementary and Secondary Schools, 1979-80 and 1980-81; and the NCES Common Core of Data (CCD), “National Public Education Financial Survey,” 1989-90 through 2001-02.

⁹³ To obtain per-pupil figures we used the 2004-05 enrollment from the California Basic Educational Data System (CBEDS), downloadable from California Department of Education at <http://www.cde.ca.gov/ds/sd/cb/studentdatafiles.asp>. The weighted total per pupil expenditure across the districts analyzed in this report is \$7,245.

⁹⁴ The averages used in this analysis are based on spending in the district serving the average student rather than spending in the average district. Our approach treats each child with equal weight in the calculations rather than treating each district with equal weight. Stated another way, the figures we present are pupil weighted rather than district weighted. The district weighted average is equal to \$7,272.

special needs populations (e.g., English learners, special education students, and students in poverty), it is possible to calculate from these specifications the cost of an adequate education for a student with no special needs for each district.⁹⁵ As Chambers et al. may not produce a stand alone special education cost estimate, we only use the base cost of an adequate education in a district with no students in poverty, no EL students, and no special education students for the purposes of our study.

Across the districts analyzed with this approach (n=823), the average “base” was \$8,874. This base is considerably higher than that derived from SACS (\$6,868), which is not surprising as the first reflects an estimate of actual current spending across districts, which are generally not currently realizing state and federal education outcome standards.⁹⁶ The second estimate is in response to the amount of funds educators say it would take, in their professional judgment, to meet these outcome standards.

Special Education Spending Estimates

Based on applying the methodological approaches described above, we have produced four special education estimates: two intended to reflect current spending and two reflecting national levels of special education provision based on SEEP findings. We show overall estimates, as well as estimates by district type – elementary, high, and unified – of varying enrollments. Disaggregating the results by different categories of districts reveals some striking variations, particularly for very large unified school districts. For instance, all individual district categories except the very large unified districts demonstrated higher estimates from SACS than that shown overall.

Note that only elementary, high, and unified districts were included in the analyses.⁹⁷ The 823 elementary, high, and unified districts included in the overall figures represent 78 percent of all districts and serve 97 percent of all students in California.⁹⁸ There are two percentages shown after the number of district observations in each grouping. The first shows the percentage of total statewide enrollment represented by the student enrollment (both general and special education) in that district group; the second is the percentage of the total number of districts in the state represented by the number of districts in each group.

In addition, the per-pupil figures estimated from these four approaches are by district of service – as opposed to district of residence. In other words, the estimates do not reflect what is being spent on special education students residing within the district boundary, but who may be served outside their district. The figures represent only what districts are spending to provide services to their current special education enrollment (i.e., students enrolled in schools in the district, whether they reside in the district or are placed there by other districts). The key reason underlying this approach is to ensure comparable figures across all methodologies, as a primary

⁹⁵ See Chambers et al. (forthcoming) for a description on how these bases were calculated.

⁹⁷ The analysis across all approaches is limited to districts that had both counts of special education students and reported special education expenditures in SACS

⁹⁸ In 2004-05, there were a total of 562 elementary, 88 high, and 329 unified districts. In addition, there were 58 county offices of education and 16 special entities, such as the California Youth Authority, state special schools, and state board of education charters, for a total of 1,053 districts.

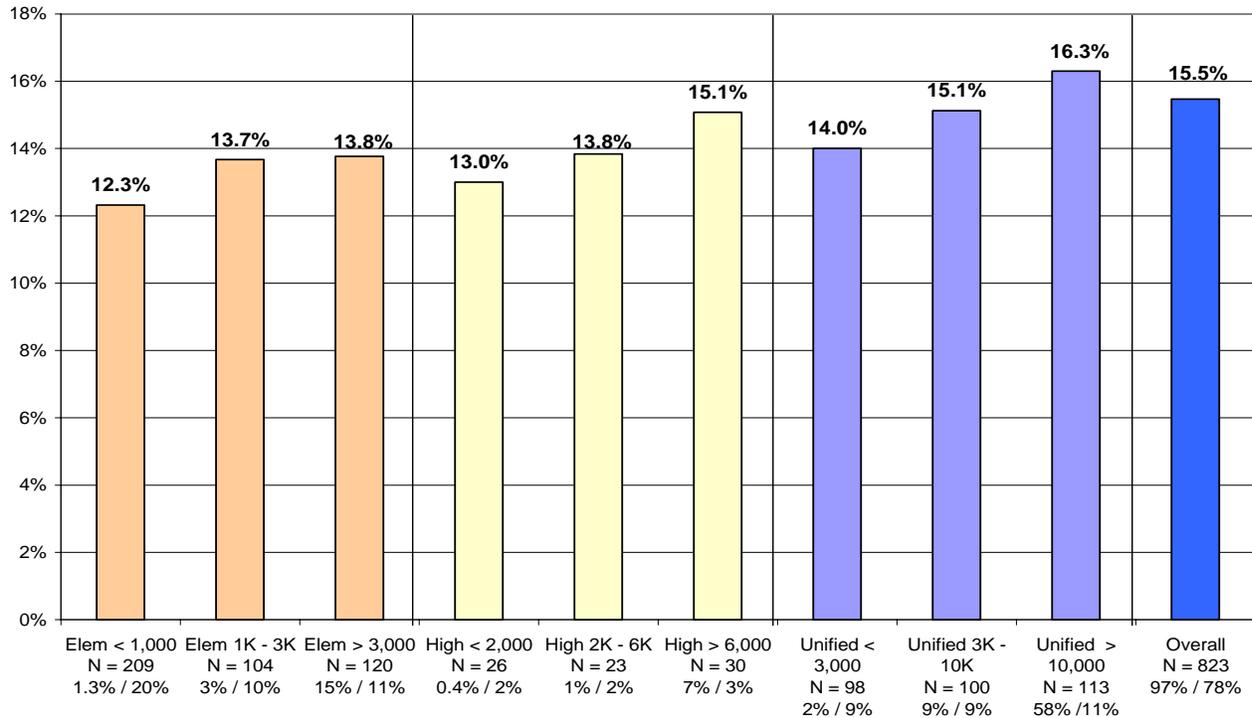
data source – the Standardized Account Code Structure (SACS) – captures expenditures for the districts providing the service.

Estimated Percentage of Total Spending

Before presenting per-pupil estimates, this section compares the percentage of total spending attributed to special education from SEEP to that estimated for California using SACS. As noted in Chapter 2, the total special education spending of \$50 billion estimated by SEEP accounts for 13.9 percent of the \$360.6 billion total spending on elementary and secondary education in the U.S. in 1999-2000. From SACS, we estimated the percentage of total spending attributed to special education in California for the 2004-05 school year to be 15.5 percent, as shown in Exhibit 4.3,. This comparison suggests that overall special education spending as a percentage of total spending is somewhat higher in California than across the nation.

Special education as a percentage of total spending ranges across districts from 12.3 percent in elementary districts with less than 1,000 students to 16.3 percent in unified districts with more than 10,000 students. The noticeably lower percentage in very small elementary districts could indicate that SACS reporting may not be reliable for those districts, or it could represent a real difference in spending patterns for students served by those districts. It is important to reiterate that these data reflect expenditures for the districts in which special education students are served rather than where they reside. Special education expenditures in very small districts may be lower than for other districts because students with severe needs residing in their community may receive their services elsewhere.

Exhibit 4.3: Special education as a percentage of total spending (SACS), 2004-05, overall and by district type and size

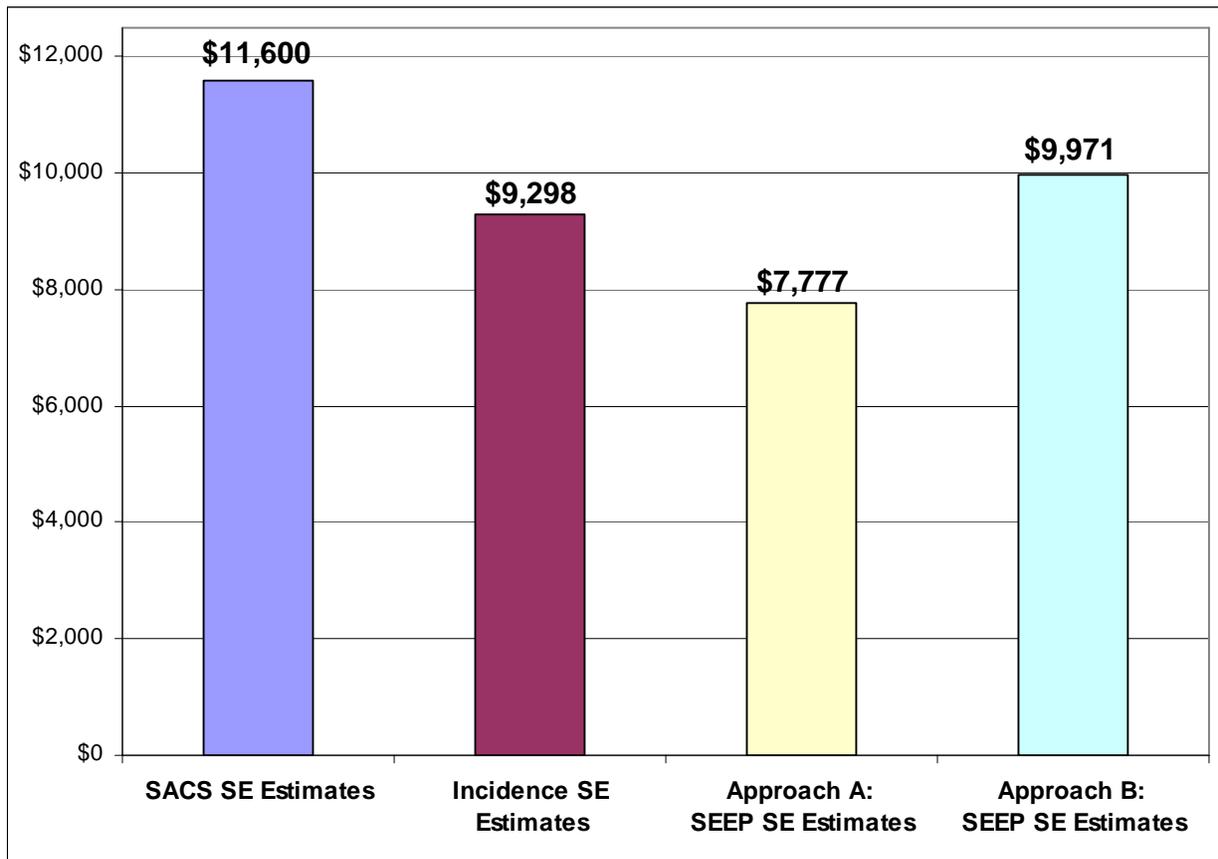


Note: 1st percentage is the percentage of the total enrollment in the state represented by students served in these districts. 2nd percentage is the percentage of all districts represented by the number of districts in each group. These figures are by district of service.

Special Education Estimates per Special Education Student

This section reviews the four estimates of special education spending per special education student, using the approaches described earlier in this chapter. Please note that the estimates are weighted by the total special education population in the 823 districts included in this analysis. As shown in Exhibit 4.4, the estimates range from \$7,777 to \$11,600 per special education student.

Exhibit 4.4: Estimated overall special education spending per special education student in California, 2004-05, across four approaches (weighted by special education enrollment)



Most striking from this exhibit is the disparity between the estimate of current actual spending derived from SACS (\$11,600) as compared to the other three estimates. One consideration in regard to interpreting the SACS estimate is that as widespread use of this system is relatively new, consistency in reporting and the assignment of costs to individual programs such as special education is likely still evolving. In addition, as SACS is based on a detailed accounting, it may be more comprehensive in its inclusion of all special education expenditures than these comparison measures. The second estimate shown above based on the findings from the California Incidence Study is \$9,298. In the last two estimates shown in this exhibit, the observed disparity between \$7,777 as derived using a SACS base and \$9,971 using a professional judgment panel base is simply the difference in these two estimates of spending on a student with no special needs. The application of the SEEP ratios against these two base amounts is identical in both cases.

It is interesting to note that even when using a professional judgment base that is much higher than a base derived from current spending levels in California and applying the SEEP ratios, the resulting estimate of adequate special education spending appears considerably lower than current practice in the state (\$9,971 vs. \$11,600). One reason that actual special education spending may be higher than estimates based on national ratios is that the special education identification rate in California at 9.5 percent is considerably lower than the national average at

12.4 percent. With a smaller percentage of students being identified for special education, it may be that students in California are on average more severe and therefore more costly than their counterparts across the nation.

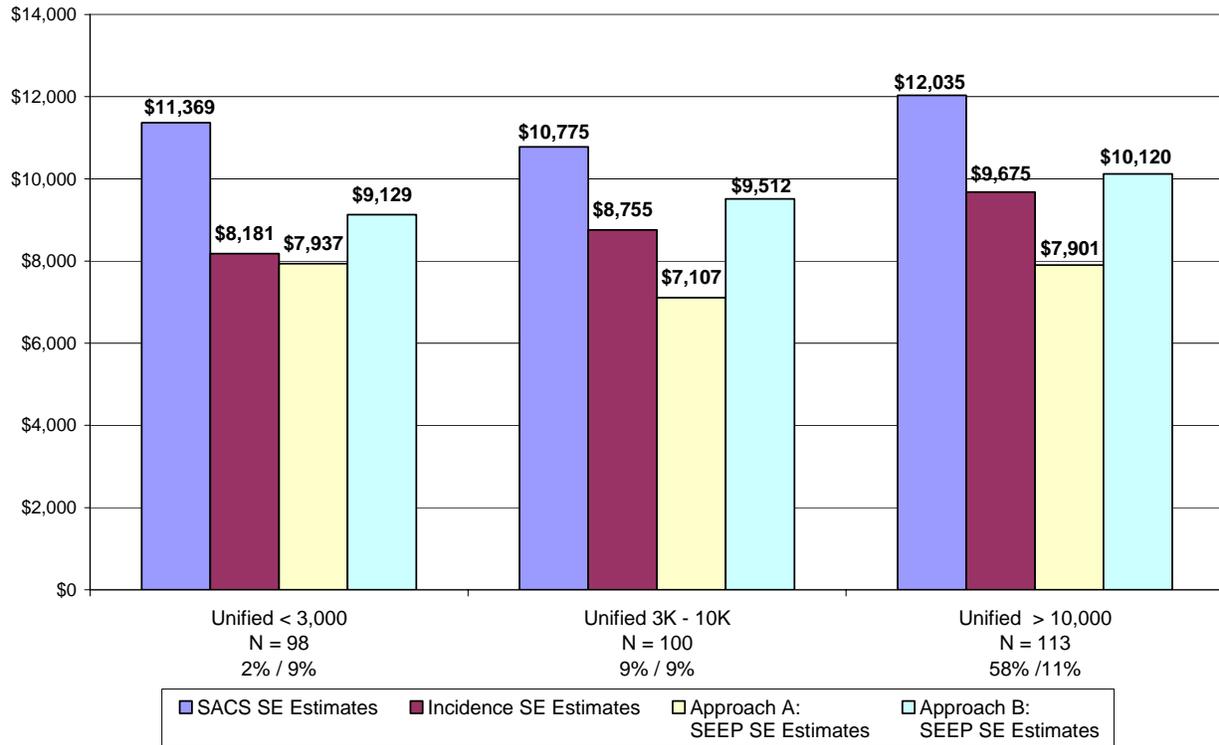
The following three exhibits (Exhibits 4.5 – 4.7) present estimates by unified, elementary, and high school districts of varying sizes.⁹⁹ As mentioned previously, there is tremendous variation in the per pupil estimates of special education spending derived from SACS (from as low as \$169 per special education student to more than \$222,000). It is not surprising then to observe different patterns when examining the estimates by district type and size, with SACS consistently appearing as the highest figure across the simulations. Across all size categories, unified districts in this analysis enroll well over two-thirds of the state's students, and comprise 29 percent of districts statewide. As noted earlier, these estimates are weighted by the number of special education students; as very large unified districts have on average relatively higher SACS estimates and serve the majority of special education students in these analyses,¹⁰⁰ this has the effect of raising the overall SACS estimate.

In Exhibit 4.5 which shows the results for unified districts, we observe declining SACS special education expenditures as the district size increases in the two smaller size categories (less than 3,000 and between 3,000 and 10,000 students). Reflecting actual expenditures, SACS data will be more sensitive to economies of scale, for example higher costs associated with serving fewer special education students that require greater use of itinerant staff or less than optimal special class sizes. On the other hand, SAC expenditures are shown to go up in districts with more than 10,000 students, which may reflect relatively higher percentages of more students with more severe service needs in these settings. Alternative approaches (Incidence and SEEP) do not make adjustments for economies of scale with respect to special education. For instance, the approaches do not distinguish between districts that have 1 student with autism as compared to those with 50. The same standard cost estimate is applied to both situations, even though there are likely efficiencies in serving larger numbers of special education students, particularly those with severe needs.

⁹⁹ In grouping the districts, we used the same size categories employed by Sonstelie and Lipscomb (forthcoming).

¹⁰⁰ Unified districts in the largest size category serve 355,677 special education students, approximately 60 percent of the 593,152 special education students included in these analyses.

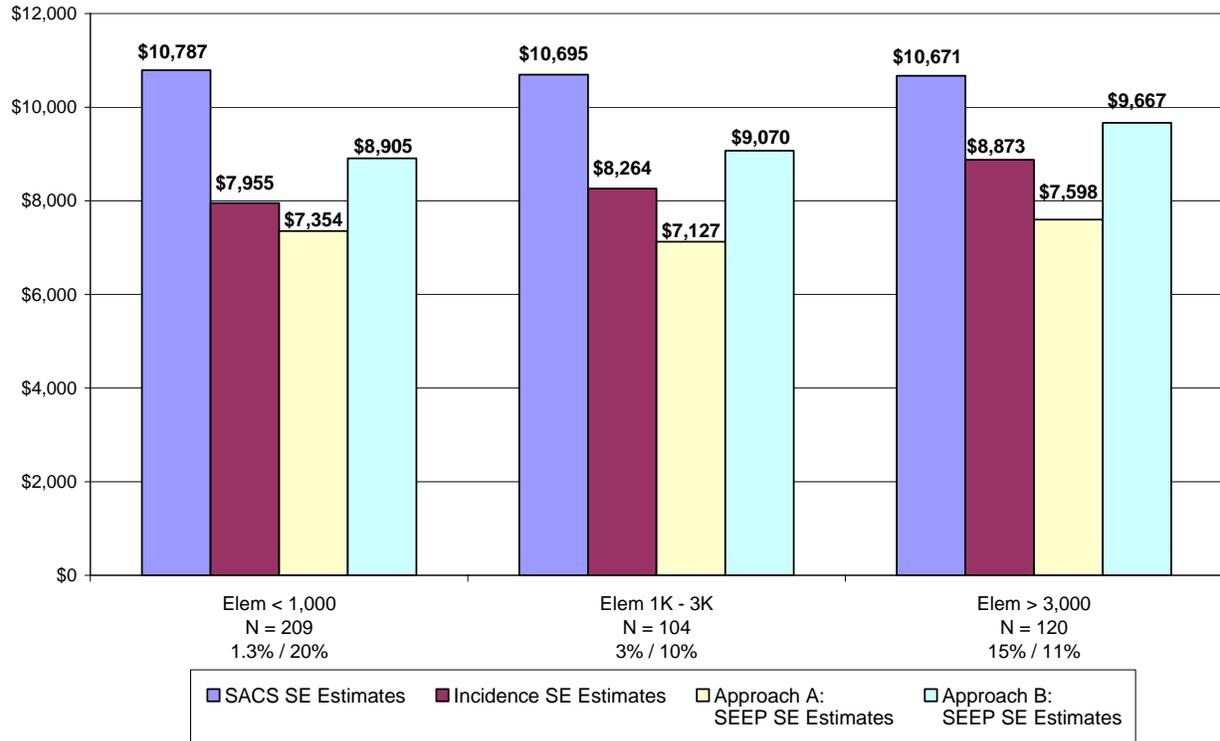
Exhibit 4.5. Unified school districts: Estimated special education spending per special education student, by district size, 2004-05 (weighted by special education enrollment)



Note: 1st percentage is the percentage of the total enrollment in the state represented by students served in these districts.
 2nd percentage is the percentage of all districts represented by the number of districts in each group.
 These figures are by district of service.

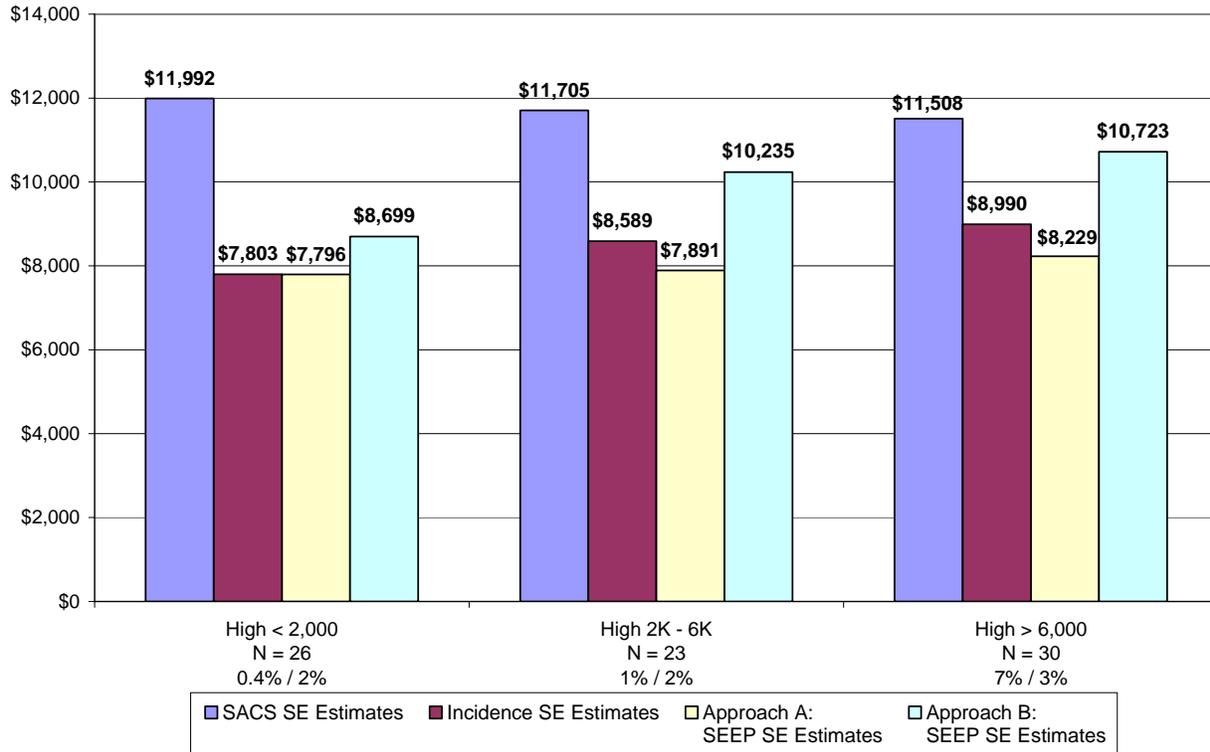
In Exhibits 4.6. and 4.7 (elementary and high school districts, respectively), we observe relatively comparable special education spending on average from SACS across all size categories.

Exhibit 4.6. Elementary districts: Estimated special education spending per special education student, by district size, 2004-05 (weighted by special education enrollment)



Note: 1st percentage is the percentage of the total enrollment in the state represented by students served in these districts.
 2nd percentage is the percentage of all districts represented by the number of districts in each group.
 These figures are by district of service.

Exhibit 4.7. High school districts: Estimated special education spending per special education student, by district size, 2004-05 (weighted by special education enrollment)



Note: 1st percentage is the percentage of the total enrollment in the state represented by students served in these districts.
 2nd percentage is the percentage of all districts represented by the number of districts in each group.
 These figures are by district of service.

Conclusion

The chapter presented four estimates of special education spending in California as alternative bases for considering adequate special education provision, representing a set of lower and upper bound estimates. The approaches used for these estimates rest on the contention that current levels of special education spending, or spending derived from some standardized spending based on actual practice, provide a reasonable basis for considering adequate special education provision given the development of an IEP for every eligible student which identifies educational goals and the services needed to reach those goals.

We acknowledge that the four estimates provided are imperfect. For instance, standardized costs or ratios do not reflect variations in costs for the same group of students at the district level. In other words, in the standardized approaches (e.g., Incidence and SEEP) the same special education estimate (or ratio) is applied to all students in the same disability category, although it is understood that students in the same disability category may have very different needs and therefore require less or more services. Also, the base used in the first SEEP approach is a rough approximation of spending on a student with no special needs (e.g., no services for special education, English learners, or Title I). In the second SEEP approach, we continue to use the same SEEP ratios even when increasing the base from an expenditure to an adequacy level. In

other words, Approach B as presented above using the professional judgment base reflects a tacit assumption that as spending on a student with no special needs increases the ratio of special education cost to total spending on special education student does not change. We recognize that this may not be the case, particularly if current levels of general education spending are viewed as inadequate. With a more substantial base, it could be argued that less would be needed for special education services.

At the same time, concerns are also associated with special education cost estimates emanating from the other adequacy studies being conducted at this time as a part of this overall California adequacy project, and in relation to other approaches to estimating adequacy not included in the overall study such as successful schools and evidence-based. In addition, none of these alternatives may provide stand alone estimates of special education adequacy.

Chapter 5: Conclusion

This report has described and to a certain extent analyzed the most conventional alternative techniques for estimating adequacy in education as they apply to special needs students, with a primary focus on special education. We argue that the two techniques not included in this larger adequacy project as a basis for deriving adequacy, i.e. the evidence-based and the successful schools approaches, are not well suited to address the question of special education adequacy.¹⁰¹ For the two other approaches commonly used for adequacy overall, the professional judgment and the econometric approaches, studies are currently in progress to estimate education adequacy for California within this overall adequacy project. As these studies will all include special education in one way or another (see Chambers et al.; Sonstelie & Lipscomb; Imazeki, forthcoming), we have not attempted to duplicate their efforts. Rather, we developed four alternative estimates to further address the question of how special education adequacy might be considered and how the resulting cost estimates compare to one another and to what is currently being spent on special education students in California.

As described in this report, the manner in which the needs of special education students have been addressed across the four primary approaches to measuring education adequacy varies considerably. Although these students constitute more than 12 percent of the total elementary and secondary public school population, and their spending makes up a considerable proportion of the overall K-12 public education, special education is treated more as an afterthought than a main theme in many of the prior adequacy studies that have been conducted across the nation.

This is undoubtedly partly because adequate special education provision is particularly challenging to define, and especially within the context of at least two of the traditional adequacy approaches. All adequacy approaches attempt to identify the resources needed for students to reach a specified level of education outcomes or results. However, by its very definition, special education is *special*, and the services necessary for individual students with disabilities to achieve the same standards as their peers may defy an adequacy approach in which resources are defined uniformly for an entire group of students.

Also, as described earlier in this report, the nature of the entitlement for special education services is vastly different than for other students, with clearly defined services tied to outcomes that are specified as part of a legally binding contract between a student's family and the providing school district. In addition, the percentage of students in special education does not always provide a clear indication of district need, or the categories of disability to which students are assigned a clear indication of severity. Thus, the consideration and incorporation of special education students and their services into a larger adequacy framework is complex.

Our review of studies defining educational adequacy shows that the evidence-based and successful schools/districts approaches offer little in the way of special education adequacy.

¹⁰¹ Note that while a paper on successful schools is a part of this overall project (Pérez et al., forthcoming), they do not attempt to use this approach as a basis for deriving an educational adequacy estimate for the state.

Their response to the question of adequacy appears to either draw upon components of other methodologies (e.g., professional judgment panels) in the case of successful schools studies or to default to the current state funding system for special education in the case of “evidence-based” studies.

On the other hand, the professional judgment and cost function approaches both have an orientation to the question of education adequacy that is broad in its perspective, incorporating the needs of all students and the complexity of the interactions that may occur between varying mixes of special populations. Although the manner in which these two methods approach the question of adequacy and their procedures for estimating adequacy are arguably on the opposite ends of two extremes in many ways, both of these methods fully include special education students in their adequacy calculations.

However, these approaches have inherent limitations as well. While their strength is the comprehensive manner in which they consider all education programming together (i.e., the needs of all students) as the single dynamic that it is, by virtue of this blended approach they tend not to provide a lot of detail in regard to defining special education adequacy.

Depending on the purposes of the study, this may or may not be important. For example, most adequacy studies are conducted to provide a reformed basis funding public education. While we believe it imperative that special education and other special populations of students be fully included in these deliberations, funding approaches based on a great deal of detailed data regarding the needs of special education students may not be the best. For example, for special education, as described above, even seemingly straightforward information such as the percentage of students in special education and how this breaks out by primary categories of disability can arguably be as misleading as informative in regard to the true degree of the need of a given district for special education services.

At the same time, as a bench mark against which other special education adequacy estimates can be compared, as a fill-in for adequacy approaches not well equipped to deal with special education, for providing a stand alone estimate of special education adequacy that incorporates a lot of detail, we believe special education expenditure analyses such those from SACS, SEEP and the California Incidence Study are quite useful in an adequacy context, and that they provide more than just an expenditure benchmark against which costs can be compared.

In this report, we have argued that special education expenditure data should be considered as one basis for considering special education in an adequacy framework. Accordingly, we generated four estimates of special education provision in California, which range from actual spending (e.g., SACS) to approximations of special education provision that might be expected if districts in California provided special education services similar to that found on average across the nation. Ranging from \$11,600 to \$7,777, these figures could feasibly be considered upper and lower bound estimates of adequate provision in California. It is also important to consider that special education students currently perform lower than the outcome levels expected under the federal accountability system (both the present and future targets). While current spending may be considered adequate for individual students to meet appropriate goals specified in their

IEP, this lower performance suggests that the figures in this report may be conservative for meeting federal targets.

Examining these estimates by district type and size reveals salient differences, particularly for large unified districts that appear to commit less of their overall expenditures to special education as well as report a smaller actual expenditure per special education student (from SACS) in comparison to the other district types and in comparison to other estimates. This variation could signify issues with using SACS as a means for accounting special education spending in relatively large, complex districts, could simply reflect pronounced economies of scale in large districts, and/or could raise other questions regarding the adequacy implications of these substantial variations in special education spending across different types of districts in the state.¹⁰²

The charge for this paper was to focus on special education adequacy. Within this context, we have attempted to consider and define this concept on its own, with a major product of these analyses being stand alone estimates of the cost of special education adequacy. Of the four standard adequacy methodologies, only the professional judgment and econometric approaches appear at least theoretically capable of producing comparable stand alone estimates of special education adequacy. Although there are questions as to whether stand-alone special education adequacy estimates can be derived from these types of approaches, to the extent this can be done such estimates would have an important advantage in that the needs of special education students can only be fully considered in relation to the general education services they receive. It is only in this holistic sense that special education adequacy can be fully considered.

As discussed, service levels that emanate from IEPs use professional judgment to delineate the services needed to produce specified outcomes. In this sense, they provide a strong basis for considering adequacy. At the same time, they are deficient in regard to the full consideration of adequacy because they build on a base of general education services that may be inadequate. If this is true, they likely overstate what is needed for special education. At the same time, the current mix of general and special education services in California arguably understate what is needed in that the outcome goals set for special education students by state and federal accountability provisions are generally not being met.

In addition to the four special education adequacy estimates in this paper, it may be possible to produce additional estimates through the professional judgment and econometric studies included in this adequacy project. They would have the advantage over those presented in this paper of estimating the cost of special education adequacy within the context of adequate general education. If comparable special education adequacy numbers could be derived from these analyses, it would be interesting to compare them to the results presented in this paper.

¹⁰² As a possible reflection of such concerns, Los Angeles Unified, which is by far the largest school district in the state, has been involved in long-standing legal proceedings regarding deficiencies in its special education provision.

References

- Andrews, M., Duncombe, W., & Yinger, J. (2002). Revisiting economies of size in American education: Are we any closer to a consensus? *Economics of Education Review*, 21, 245-262.
- Augenblick, J. (1997). *Recommendations for a base figure and pupil-weighted adjustments to the base figure for use in a new school finance system in Ohio*. Columbus, OH: Ohio Department of Education.
- Augenblick, J., Brown, A., DeCesare, D., Myers, J., & Silverstein, J. (2006). *Estimating the cost of an adequate education in South Dakota* (Prepared for the Alliance for Education). Denver, CO: Augenblick, Palaich and Associates, Inc.
- Augenblick & Myers, Inc. (2001a). *A procedure for calculating a base cost figure and an adjustment for at-risk pupils that could be used in the Illinois school finance system* (Prepared for the Education Funding Advisory Board). Denver, CO: Author.
- Augenblick & Myers, Inc. (2001b). *Calculation of the cost of an adequate education in Maryland in 1999-2000 using two different analytic approaches* (Prepared for the Maryland Commission on Education Finance, Equity, and Excellence (Thornton Commission)). Denver, CO: Author.
- Augenblick & Myers, Inc. (2003a). *Calculation of the cost of an adequate education in Colorado using the Professional Judgment and the Successful School District approaches* (Prepared for the Colorado School Finance Project). Denver, CO: Author.
- Augenblick & Myers, Inc. (2003b). *Calculation of the cost of an adequate education in Missouri using the Professional Judgment and the Successful School District approaches* (Prepared for the Missouri Education Coalition for Adequacy (MECA)). Denver, CO: Author.
- Augenblick & Myers, Inc. (2003c). *Calculation of the cost of an adequate education in Nebraska in 2002-2003 using the Professional Judgment approach* (Prepared for the Nebraska State Education Association, Greater Nebraska Schools Association, Lincoln Public Schools, Nebraska Association of School Boards, Nebraska Coalition for Educational Equity and Adequacy, Nebraska Council of School Administrators, Nebraska Rural Community Schools Association, Omaha Public Schools, and Westside Community Schools). Denver, CO: Author.
- Augenblick, J., Myers, J., & Silverstein, J. (1998). *Alternative approaches for determining a base figure and pupil-weighted adjustments for use in a school finance system in New Hampshire* (Prepared for the Adequate Education Costs and Municipal Grant Distribution Commission of New Hampshire). Denver, CO: Augenblick & Myers, Inc.
- Augenblick, J., Myers, J., Silverstein, J., & Barkis, A. (2002). *Calculation of the cost of a suitable education in Kansas in 2000-2001 using two different analytic approaches* (Prepared for the Legislative Coordinating Council). Denver, CO: Augenblick & Myers, Inc.

- Augenblick, Palaich and Associates, Inc. (2003a). *Calculation of the cost of an adequate education in North Dakota in 2002-2003 using the Professional Judgment approach* (Prepared for the North Dakota Department of Public Instruction). Denver, CO: Author.
- Augenblick, Palaich and Associates, Inc. (2003b). *Calculation of the cost of an adequate education in Tennessee in 2001-02 using the Professional Judgment and the Successful School District approaches* (Prepared for the Coalition for Tennessee's Future). Denver, CO: Author.
- Augenblick, J., Palaich, P., Silverstein, J., Rose, D., & DeCesare, D. (2005). *Estimating the cost of an adequate education in Connecticut* (Prepared for The Connecticut Coalition for Justice in Education Funding). Denver, CO: Augenblick, Palaich and Associates, Inc.
- Augenblick, J., Van de Waters, G., & Myers, J. (1993). *School finance in Mississippi: A proposal for an alternate system* (Prepared for the State Department of Education). Jackson, MS: Mississippi State Department of Education.
- Baker, B. (2006, July). *Evaluating the reliability, validity and usefulness of education cost studies*. Paper presented at the O'Leary Endowment Lecture Series, University Club of Chicago, Chicago, IL.
- Chambers, J.G. (1997). *Measuring geographic differences in public school costs* (Working paper). Washington, DC: U.S. Department of Education, National Center for Education Statistics.
- Chambers, J.G., & Levin, J.D. (2006). School finance, Part II: What challenges do we face? In H. Hatami (Ed.), *Crucial issues*. Berkeley, CA: Policy for California Education. Manuscript submitted for publication.
- Chambers, J.G., & Parrish, T.B. (1983). Deriving cost based state school finance formulae. *Educational Comment* 83. Toledo, OH: University of Toledo.
- Chambers, J.G., & Parrish, T.B. (December, 1982). *The development of a resource cost model funding base for education finance in Illinois, Volume I B executive summary, and Volume II B technical report* (prepared for the Illinois State Board of Education). Stanford, CA: Associates for Education Finance and Planning.
- Chambers, J.G., & Parrish, T.B. (1984). *The development of a program cost model and a cost-of-education index for the State of Alaska: Final Report, Volumes I-IV*. Stanford, CA: Associates for Education Finance and Planning, Inc.
- Chambers, J.G., Parrish, T.B., Levin, J.D., Smith, J.R., Guthrie, J.W., Seder, R.C., & Taylor, L. (2004, March). *The New York Adequacy Study: Determining the cost of providing all children in New York an adequate education – Final report*. Palo Alto, CA: American Institutes for Research.
- Chambers, J.G., Pérez, M., Harr J.J., and Shkolnik, J. (2005). Special Education Spending Estimates From 1999-2000. *Journal of Special Education Leadership*, 18(1), 5-13.
- Duncombe, W., & Yinger, J. (2005). How much more does a disadvantaged student cost? *Economics of Education Review*, 24, 513-532.
- Fermanich, M., Mangan, M.T., Odden, A., Picus, L.O., Gross, B., & Rudo, Z. (2006, July). *Washington Learns: Successful district study* (Working draft, prepared for Washington Learns). North

- Hollywood, CA: Lawrence O. Picus and Associates. Retrieved August 15, 2006, from <http://www.washingtonlearns.wa.gov/materials/WALearnsSuccessfulDistrictReport7-13-06.pdf>
- Gronberg, T., Jansen, D., Taylor, L., & Booker, K. (2005). *School outcomes and school costs: A technical supplement*. College Station, TX: Texas A&M University, Bush School of Government and Public Service. Retrieved August 14, 2006, from <http://bush.tamu.edu/research/faculty%5Fprojects/txschoolfinance/papers/GJTBTechSupplement4-8.pdf>
- Guthrie, J.W., Hayward, G.C., Smith, J.R., Rothstein, R., Bennett, R.W., Koppich, J.E., Bowman, E., DeLapp, L., Brandes, B., & Clark, S. (1997). *A Proposed Cost Based Block Grant Model for Wyoming School Finance* (Submitted to Joint Appropriations Committee of the Wyoming Legislature). Davis, CA: Management Analysis & Planning Associates, L.L.C.
- Hanushek, E.A. (2005, October). *The alchemy of "costing out" an adequate education*. Paper presented at the meeting "Adequacy Lawsuits: Their growing impact on American Education" held at the Kennedy School of Government, Harvard University, Cambridge, MA.
- Hanushek, E.A. (2005, Fall). Pseudo-science and a sound basic education. *Education Next*, 5(4), 67-73. Retrieved August 16, 2006, from <http://www.educationnext.org/20054/67.html>
- Harr, J.J., Socias, M., Parrish, T., & Graczewski, C. (2004). Study to Measure the Delivery of Services in Accordance with the Individualized Education Programs of Students with Disabilities in the Los Angeles Unified School District: Final Report. Palo Alto, CA: American Institutes for Research.
- Harr, J.J., Pérez, M., McLaughlin, D., & Blankenship, C. (2005). *Participation of and accommodations for students with disabilities: Report on task 1.1: Participation policies* (NAEP State Analysis Project). Palo Alto, CA: American Institutes for Research.
- Haveman, M. (2004). *Determining the cost of an adequate education in Minnesota*. St. Paul, MN: Minnesota Center for Public Finance Research.
- Johnson, S. (2003, Fall). Reexamining Rowley: A New Focus in Special Education Law. *The Beacon: Journal of Special Education Law and Practice*. 2(2). Retrieved October 19, 2006, from <http://www.harborouselaw.com/articles/rowley.reexamine.johnson.htm>
- Kakalik, J.S., Furry, W.S., Thomas, M.A., & Carney, M.F. (1981). *The Cost of Special Education*. Santa Monica, CA: The Rand Corporation.
- Levin, H.M. & McEwan, P.J. (2001). *Cost-Effectiveness Analysis* (2nd Edition). Thousand Oaks, CA: Sage Publications, Inc.
- Moore, M.T., Strang, E.W., Schwartz, M., & Braddock, M. (1988). *Patterns in Special Education Service Delivery and Cost*. Washington, DC: Decision Resources Corporation.
- Myers, J., & Silverstein, J. (2002). *Calculation of the cost of a suitable education in Montana in 2001-2002 using the Professional Judgment approach* (Prepared for Montana School Boards Association, Montana Quality Education Coalition, Montana Rural Education Association, Montana Association of School Business Officials, and Montana Association of County School Superintendents). Denver, CO: Augenblick & Myers, Inc.

- National Conference of State Legislatures. (2004). *Vermont education finance study* (Prepared for Vermont Department of Education). Denver, CO: Author.
- Odden, A. (1998). *Recommendations for resolving New Jersey Abbott v. Burke IV, after the November and December 1997 hearings*. Report to the Honorable Judge Patrick Michael King.
- Odden, A., Fermanich, M., & Picus, L.O. (2003). *A state-of-the-art approach to school finance adequacy in Kentucky* (Prepared for the Kentucky Department of Education). North Hollywood, CA: Lawrence O. Picus and Associates.
- Odden, A., Picus, L., & Fermanich, M. (2003). *An evidence-based approach to school finance adequacy in Arkansas* (Prepared for the Arkansas Joint Committee on Educational Adequacy). North Hollywood, CA: Lawrence O. Picus and Associates.
- Odden, A., Picus, L., Fermanich, M., & Goetz, M. (2004). *An evidence-based approach to school finance adequacy in Arizona* (Prepared for the Steering Committee of the Arizona School Finance Adequacy Study funded by the Rodel Charitable Foundation of Arizona with additional support from Greater Phoenix Leadership). North Hollywood, CA: Lawrence O. Picus and Associates.
- Odden, A., Picus, L.O., Goetz, M., Fermanich, M., Seder, R.C., Glenn, W., & Nelli, R. (2005). *An evidence-based approach to recalibrating Wyoming's block grant school funding formula* (Prepared for the Wyoming Legislative Select Committee on Recalibration). North Hollywood, CA: Lawrence O. Picus and Associates.
- Odden, A., Picus, L.O., Goetz, M., Mangan, M.T., & Fermanich, M. (2006, July). *An evidenced-based approach to school finance adequacy in Washington* (Working draft, prepared for the K-12 Advisory Committee of Washington Learns). North Hollywood, CA: Lawrence O. Picus and Associates. Retrieved August 15, 2006, from http://www.washingtonlearns.wa.gov/materials/Tab1Doc1EvidenceBasedReportforAC7-18-06_02.pdf
- Oliver, D.F. & Fidler, P. (2006). *Study to Measure the Delivery of Services in Accordance with the Individualized Education Programs of Students with Disabilities* (Submitted to the Office of the Independent Monitor, Los Angeles Unified School District). Planning, Assessment and Research Division Publication No. 318. Los Angeles Unified School District: Program Evaluation and Research Branch
- Oliver, D.F., Thomas, P., & Fidler, P. (2005). *Study to Measure the Delivery of Services in Accordance with the Individualized Education Programs of Students with Disabilities* (Submitted to the Office of the Independent Monitor, Los Angeles Unified School District). Planning, Assessment and Research Division Publication No. 267. Los Angeles Unified School District: Program Evaluation and Research Branch
- Parrish, T., & Harr, J. (2006). *Special education funding in North Dakota: An assessment of current practice and recommendations for the future*. Palo Alto, CA: American Institutes for Research, Center for Special Education Finance.
- Parrish, T., Harr, J., Kidron, Y., Brock, L., & Anand, P. (2003). *Study of the Incidence Adjustment in the Special Education Funding Model: Final Report*. Palo Alto, CA: American Institutes for Research.

- Parrish, T., Harr, J. J., Pérez, M., Esra, P., Brock, L., & Shkolnik, J. (2002). *Wyoming Special Education Expenditure Project and Cost Based Funding Model: Final Report*. Palo Alto, CA: American Institutes for Research.
- Parrish, T., Harr, J., Wolman, J., Anthony, A. Merickel, & Esra, P. (2004). *State Special Education Finance Systems, 1999-2000, Part II: Special Education Revenues and Expenditures*. Palo Alto, CA: American Institutes for Research, Center for Special Education Finance.
- Pérez, M., Harr, J.J., McLaughlin, D., & Blankenship, C. (2005). *Participation of and accommodations for English language learners: Report on task 1.1: Participation policies* (NAEP State Analysis Project). Palo Alto, CA: American Institutes for Research.
- Picus, L. O., Odden, A., & Fermanich, M. (2003). *A professional judgment approach to school finance adequacy in Kentucky* (Prepared for the Kentucky Department of Education). North Hollywood, CA: Lawrence O. Picus and Associates.
- Reschovsky, A., & Imazeki, J. (2003). Let no child be left behind: Determining the cost of improving student performance. *Public Finance Review*, 31(10), 1-29.
- Rossmiller, R.A., Hale, J.A., & Frohreich, L.E. (1970). *Resource Configurations and Costs* (National Educational Finance Project, Special Study No. 2). Madison, WI: University of Wisconsin, Department of Educational Administration.
- Simeonsson, R.J., Bailey, D. (1988). *Essential Elements of the Assessment Process*. Assessment of Developmentally Disabled Infants and Preschool Children, New York: Plenum Press. Pp. 24-41.
- Simeonsson, R.J., Bailey, D., Smith, T., & Buysse, V. (1995). Young Children with Disabilities: Functional Assessment by Teachers. *Journal of Developmental and Physical Disabilities*, 7(4), 267-285.
- Smith, J.R. (2002). *Proposed Revisions to the Cost Block Grant* (Submitted to the Wyoming State Legislature). Davis, CA: Management Analysis & Planning Associates.
- Standard and Poor's School Evaluation Service. (2004). *Resource adequacy study for the New York State commission on education reform*. New York, NY: Author.
- Taylor, L., Baker, B., & Vedlitz, A. (2005). *Measuring educational adequacy in public schools*. College Station, TX: Texas A&M University, Bush School of Government and Public Service. Retrieved August 14, 2006, from http://bush.tamu.edu/research/working%5Fpapers/ltaylor/measuring_edu_adequacy_in_public_schools.pdf
- U.S. Department of Education. (2006, August). *Federal Register: Assistance to States for the Education of Children with Disabilities and Preschool Grants for Children with Disabilities; Final Rule* (34 CFR Parts 300 and 301). Washington, DC: Author.
- Verstegen, D.A. (2003). *The calculation of the cost of an adequate education in Kentucky*. Oldham, KY: Council for Better Education, Inc.

Verstegen, D.A. (2004). Calculation of the cost of an adequate education in Kentucky: A Professional Judgment approach. *Education Policy Analysis Archives*, 12(8). Retrieved August 7, 2006, from <http://epaa.asu.edu/epaa/v12n8/>.

Appendices

Appendix A. Recommended Special Education Staffing Ratios for Wyoming (based on Parrish et al., 2002)

Exhibit A-1. Recommended Wyoming Special Education Staffing Guidelines, based on 2000-01 Student Population

Special Education Personnel	Number of Students Per FTE Staff Based on:		
	Number of Special Education Students Receiving the Service	Number of Special Education Students (n=11,772)	Average Daily Membership (Regular and Special) (n=85,353)
Special Education Teacher	n/a	16.6	120
Instructional Aide	n/a	13.8	100
Adaptive PE	34	690	5,000
Physical Therapist	37	896	6,500
Occupational Therapist	39	310	2,250
Related Service Aide	n/a	34	250
Speech Pathologist	40	114	825
Audiologist	14	1,379	10,000
Hearing Screening Technician	n/a	1,379	10,000
Vision Screening Technician	n/a	1,379	10,000
Diagnostic Staff	4	207	1,500
Guidance Counselor	15	172	1,250
School Social Worker	20	172	1,250
School Nurse	1	276	2,000

Source: *Wyoming Special Education Expenditure Project and Cost Based Funding Model: Final Report*, Parrish, Harr, Pérez, Esra, Brock, & Shkolnik (2002).

Exhibit A-2: Recommended Number of FTE Special Education Administrative Staff Based on District Size, Wyoming

Size	Average Daily Membership	Director, including Assistant Director	Secretarial Support
Large	3,500+	2	6
Medium	1,000-3,499	1	3
Small	550-999	1	1.5
Very Small	Less than 550	0.8	1

Source: *Wyoming Special Education Expenditure Project and Cost Based Funding Model: Final Report*, Parrish, Harr, Pérez, Esra, Brock, & Shkolnik (2002).

Exhibit A-3. Guidelines for Special Education Related Service Providers Serving Remote Populations, Wyoming

Special Education Personnel	Number of Students Per FTE Staff Based on:		
	Number of Special Education Students Receiving the Service	Number of Special Education Students (n=11,772)	Average Daily Membership (Regular and Special) (n=85,353)
Adaptive Physical Education (PE)	26	517	3,750
Physical Therapist	28	672	4,875
Occupational Therapist	30	233	1,688
Related Service Aide	26	26	188
Speech Pathologist	30	85	619
Audiologist	10	1,034	7,500
Hearing Screening Technician	n/a	1,034	7,500
Vision Screening Technician	n/a	1,034	7,500
Diagnostic Staff	3	155	1,125
Guidance Counselor	11	129	938
School Social Worker	15	129	938
School Nurse	1	207	1,500

Source: *Wyoming Special Education Expenditure Project and Cost Based Funding Model: Final Report*, Parrish, Harr, Pérez, Esra, Brock, & Shkolnik (2002).

APPENDIX B. Examples of Panel Configurations of Selected Professional Judgment Panel Studies

Colorado Professional Judgment Panels, Augenblick & Myers (2003)

<i>Number and type of panels (9 total)</i>	<i>Responsibility</i>
4 school-level panels	Each school-level panel responsible for specifying resources for prototypical elementary, middle, and high schools for districts of certain scale: <ul style="list-style-type: none"> ▪ 1 panel for schools in small (no middle school prototype) and very small districts ▪ 1 panel for schools in moderate size districts ▪ 1 panel for schools in large districts ▪ 1 panel for schools in very large districts
4 district-level panels	Each district-level panel responsible for reviewing the school-level specifications and specifying resources for districts of certain scale <ul style="list-style-type: none"> ▪ 1 panel for very small and small districts ▪ 1 panel for moderate size districts ▪ 1 panel for large districts ▪ 1 panel for very large districts
1 expert panel*	Review the specifications of the district-level panels and discuss appropriate prices

* Experts were individuals in the state who were “identified as having extensive knowledge of how schools and school districts operate and the resources schools need to fulfill their objectives.

Connecticut Professional Judgment Panels, Augenblick, Palaich, Silverstein, Rose, & DeCesare (2005)

<i>Number and type of panels (6 total)</i>	<i>Responsibility</i>
2 school-level panels	Each school-level panel is responsible for “building” hypothetical elementary, middle, and high schools designed to accomplish a specific set of performance objectives and standards for districts of certain configuration: <ul style="list-style-type: none"> ▪ 1 panel for schools in K-8 districts ▪ 1 panel for schools in K-12 districts
3 district-level panels	Each district-level panel reexamined the work of the school-level panel and added personnel and other costs that tend not to be school-based (such as costs for district business staff or for an alternative school) for districts of certain scale [Note: The school-level panel addressing K-8 schools also handled K-8 district-level resource needs since these districts were so small]: <ul style="list-style-type: none"> ▪ 1 panel for small districts ▪ 1 panel for moderate size districts ▪ 1 panel for large districts
1 expert panel	Review the specifications of the district-level panels, discuss appropriate prices, examine preliminary cost figures and attempt to resolve some of the inconsistencies that arose across panels.

Kansas Professional Judgment Panels, Augenblick, Myers, Silverstein, Barkis of Augenblick & Myers, Inc. (2002)

<i>Number and type of panels (7 total)</i>	<i>Responsibility</i>
4 school-level panels	Each school-level panel responsible for specifying resources for prototypical elementary, middle, and high schools for districts of certain scale: <ul style="list-style-type: none"> ▪ 1 panel for schools in small and very small districts (no middle school prototype) ▪ 2 panel for schools in moderate size districts ▪ 1 panel for schools in large districts
2 district-level panels	Each district-level panel responsible for reviewing the school-level specifications and specifying resources for districts of certain scale <ul style="list-style-type: none"> ▪ 1 panel for very small, small and moderate size districts ▪ 1 panel for moderate and large districts
1 expert panel*	Review the specifications of the district-level panels, discuss appropriate prices, and examined cost figures

* Experts were individuals in the state who were “identified as having extensive knowledge of how schools and school districts operate and the resources schools need to fulfill their objectives.

Kentucky Professional Judgment Panels, Picus, Odden, Fermanich (2003)

<i>Number and type of panels (9 total)</i>	<i>Responsibility¹⁰³</i>
6 school-level panels	<ul style="list-style-type: none"> ▪ 1 panel for elementary schools in Eastern Kentucky ▪ 1 panel for middle schools in Eastern Kentucky ▪ 1 panel for high schools in Eastern Kentucky ▪ 1 panel for elementary schools in Western Kentucky ▪ 1 panel for middle schools in Western Kentucky ▪ 1 panel for high schools in Western Kentucky
2 district-level panels	<ul style="list-style-type: none"> ▪ 1 panel for districts in Eastern Kentucky ▪ 1 panel for districts in Western Kentucky
1 state-level panel	

Kentucky Professional Judgment Panels, Verstegen (2003)

<i>Number and type of panels (7 total)</i>	<i>Responsibility</i>
3 school-level panels	<p>Each school-level panel responsible for specifying resources for prototypical elementary, middle, and high schools for districts of certain scale:</p> <ul style="list-style-type: none"> ▪ 1 panel for schools in small to medium districts ▪ 1 panel for schools in medium to large districts ▪ 1 panel for schools in large to very large districts
3 district-level panels	<p>Each district-level panel responsible for reviewing the school-level specifications and specifying resources for districts of certain scale</p> <ul style="list-style-type: none"> ▪ 1 panel for schools in small to medium districts ▪ 1 panel for schools in medium to large districts ▪ 1 panel for schools in large to very large districts
1 expert panel*	Review the specifications of the district-level panels and discuss appropriate prices

* Experts were individuals in the state who were “identified as having extensive knowledge of how schools and school districts operate and the resources schools need to fulfill their objectives.

¹⁰³ The specific responsibilities of each type of panel is not described in the report.

Maryland Professional Judgment Panels, Augenblick & Myers, Inc. (2001)

<i>Number and type of panels (7 total)</i>	<i>Responsibility</i>
6 school-level panels	Each panel is responsible for specifying resources for the assigned prototypical school type: <ul style="list-style-type: none"> ▪ 2 panels for prototypical elementary school ▪ 2 panels for prototypical middle school ▪ 2 panels for prototypical high school
1 expert panel*	Review the work of the prototype teams as well as to develop district level resource estimates

* Report did not specify how they determined individuals who can be included in the expert panel.

Missouri Professional Judgment Panels, Augenblick & Silverstein (2003)

<i>Number and type of panels (9 total)</i>	<i>Responsibility</i>
4 school-level panels	Each school-level panel responsible for specifying resources for prototypical elementary, middle, and high schools for districts of certain scale: <ul style="list-style-type: none"> ▪ 1 panel for schools in small and very small districts (no middle school prototype) ▪ 1 panel for schools in moderate size districts ▪ 1 panel for schools in large districts ▪ 1 panel for schools in very large districts
4 district-level panels	Each district-level panel responsible for reviewing the school-level specifications and specifying resources for districts of certain scale <ul style="list-style-type: none"> ▪ 1 panel for very small and small districts ▪ 1 panel for moderate size districts ▪ 1 panel for large districts ▪ 1 panel for very large districts
1 expert panel*	Review the specifications of the district-level panels and discuss appropriate prices

* Experts were individuals in the state who were “identified as having extensive knowledge of how schools and school districts operate and the resources schools need to fulfill their objectives.

Montana Professional Judgment Panels, Myers & Silverstein of Augenblick & Myers, Inc. (2002)

<i>Number and type of panels (11 total)</i>	<i>Responsibility</i>
5 school-level panels	Each school-level panel responsible for specifying resources for prototypical elementary, middle, and high schools for districts of certain scale: <ul style="list-style-type: none"> ▪ 1 panel for schools in small and very small districts (no middle school prototype) ▪ 2 panels for schools in moderate size districts ▪ 1 panel for schools in large districts ▪ 1 panel for schools in very large districts
5 district-level panels	Each district-level panel responsible for reviewing the school-level specifications and specifying resources for districts of certain scale <ul style="list-style-type: none"> ▪ 1 panel for very small and small districts ▪ 2 panels for moderate size districts ▪ 1 panel for large districts ▪ 1 panel for very large districts
1 expert panel*	Review the specifications of the district-level panels and discuss appropriate prices

* Experts were individuals in the state who were “identified as having extensive knowledge of how schools and school districts operate and the resources schools need to fulfill their objectives.

Nebraska Professional Judgment Panels, Augenblick & Myers, Inc. (2002)

<i>Number and type of panels (8 total)</i>	<i>Responsibility</i>
1 school & district level panel	1 panel was responsible for specifying school-level and district level resources for elementary districts
3 school-level panels	Each school-level panel responsible for specifying resources for prototypical elementary, middle, and high schools for districts of certain scale: <ul style="list-style-type: none"> ▪ 1 panel for schools in small and very small districts (no middle school prototype) ▪ 1 panel for schools in moderate size districts ▪ 1 panel for schools in large districts
3 district-level panels	Each district-level panel responsible for reviewing the school-level specifications and specifying resources for districts of certain scale <ul style="list-style-type: none"> ▪ 1 panel for very small and small districts ▪ 1 panel for moderate size districts ▪ 1 panel for large districts
1 expert panel*	Review the specifications of the district-level panels and discuss appropriate prices

* Experts were individuals in the state who were “identified as having extensive knowledge of how schools and school districts operate and the resources schools need to fulfill their objectives.

North Dakota Professional Judgment Panels, Augenblick, Palaich, & Associates (2003)

<i>Number and type of panels (8 total)</i>	<i>Responsibility</i>
4 school-level panels	Each school-level panel responsible for specifying resources for prototypical elementary, middle, and high schools for districts of certain scale: <ul style="list-style-type: none"> ▪ 1 panel for schools in small and very small K-8 districts ▪ 1 panel for schools in small and very small districts ▪ 1 panel for schools in moderate size districts ▪ 1 panel for schools in large districts
3 district-level panels	Each district-level panel responsible for reviewing the school-level specifications and specifying resources for districts of certain scale <ul style="list-style-type: none"> ▪ 1 panel for very small and small K-8 and K-12 districts ▪ 1 panel for moderate size districts ▪ 1 panel for large districts
1 expert panel*	Review the specifications of the district-level panels and discuss appropriate prices

* Experts were individuals in the state who were “identified as having extensive knowledge of how schools and school districts operate and the resources schools need to fulfill their objectives.

South Dakota Professional Judgment Panels, Augenblick, Brown, DeCesare, Myers, & Silverstein (2006)

<i>Number and type of panels (7 total)</i>	<i>Responsibility</i>
3 school-level panels	Each school-level panel is responsible for “building” hypothetical elementary, middle, and high schools designed to accomplish a specific set of performance objectives and standards for districts of certain scale: <ul style="list-style-type: none"> ▪ 1 panel for schools in small and very small districts ▪ 1 panel for schools in moderate size districts ▪ 1 panel for schools in large districts
3 district-level panels	Each district-level panel reexamined the work of the school-level panel and added personnel and other costs that tend not to be school-based (such as costs for district business staff or for an alternative school) for districts of certain scale: <ul style="list-style-type: none"> ▪ 1 panel for very small and small districts ▪ 1 panel for moderate size districts ▪ 1 panel for large districts
1 expert panel	Review the specifications of the district-level panels, discuss appropriate prices, examine preliminary cost figures and attempt to resolve some of the inconsistencies that arose across panels.

Tennessee Professional Judgment Panels, Augenblick, Palaich and Associates, Inc. (2003)

<i>Number and type of panels (9 total)</i>	<i>Responsibility</i>
4 school-level panels	Each school-level panel responsible for specifying resources for prototypical elementary, middle, and high schools for districts of certain scale: <ul style="list-style-type: none"> ▪ 1 panel for schools in small and very small districts ▪ 1 panel for schools in moderate size districts ▪ 1 panel for schools in large districts ▪ 1 panel for schools in very large districts
4 district-level panels	Each district-level panel responsible for reviewing the school-level specifications and specifying resources for districts of certain scale <ul style="list-style-type: none"> ▪ 1 panel for very small and small districts ▪ 1 panel for moderate size districts ▪ 1 panel for large districts ▪ 1 panel for very large districts
1 expert panel*	Review the specifications of the district-level panels and discuss appropriate prices

* Experts were individuals in the state who were “identified as having extensive knowledge of how schools and school districts operate and the resources schools need to fulfill their objectives.

Appendix C. Comparison of Base Estimates from Selected Studies Using Both the Professional Judgment and Successful Schools/Districts Approach

State	Author (Year)	Professional Judgment Base (unadjusted \$)	Successful Schools/Districts Base (unadjusted \$)	Recommended Base	Notes
Colorado	Augenblick & Myers, Inc (2003a)	\$6,815	\$4,654	\$4,798	"The fact is that the base cost figure derived from the professional judgment approach is a goal in much the same way that the expectation that all students will meet state standards in 2013-14 is a goal. That is, the state performance benchmark for 2002 represents partial achievement of an ultimate objective – the average performance benchmark for 2002 is about 70.4 percent of the expectation for 2013-14. Therefore, if \$6,815 represents the full cost of meeting all standards, it seems reasonable to assume that 70.4 percent of that amount, \$4,798, would be the amount needed to reach the 2002

State	Author (Year)	Professional Judgment Base (unadjusted \$)	Successful Schools/Districts Base (unadjusted \$)	Recommended Base	Notes
					performance benchmark” (page VI-2).
Connecticut	Augenblick, Palaich, Silverstein, Rose, & DeCesare (2005)	\$9,414/\$10,388 ¹	\$8,635/\$7,716 ¹	See Notes.	<p>“In some sense, then, costs based on the SSD base represent a starting point. Costs based on the PJ base represent the goal of adequacy for all children in Connecticut – a target that might take a few years to reach but that would ensure that districts have the resources needed to meet higher performance expectations by 2013.” (page 62)</p> <p>The researchers “created formulas that could be applied to the base cost results obtained from the successful school district approach so that the graphical interpretation of the relationship between size and base cost would be the same shape as the relationship between base cost and size using PJ results” (page 64). The formulas generated district-specific bases under either approach that varied by district size. Either set of formulas could be adopted.</p>
Maryland	Augenblick & Myers, Inc. (2001b)	\$6,612	\$5,969	Either one or use these figures as the min and max base spending	<p>“We believe that it is perfectly appropriate to view the base cost associated with the successful school approach as a floor and the base cost associated with the professional judgment approach as a ceiling – that is to choose a figure somewhere between the two” (page 29).</p> <p>“...for 1999-2000, the total cost would have been \$8.796 billion” using the PJ base costs and weights or \$7.939 billion using the SS base costs and PJ weights” (page 30).</p>
Missouri	Augenblick & Myers, Inc.	\$7,832	\$5,664 (DESE); \$5,679	\$5,428	“Since, on average, 69.3 percent of students in the 102 successful school districts are rated as nearing proficient

¹ These figures are base costs for K-6/8 and moderately sized K-12 districts respectively. No comparable successful district base was calculated for small or large K-12 districts.

State	Author (Year)	Professional Judgment Base (unadjusted \$)	Successful Schools/Districts Base (unadjusted \$)	Recommended Base	Notes
	(2003b)		(modified group) ²		or better, it might reasonably be expected that those districts should be spending 69.3 percent of \$7,832 (the amount theoretically needed to get 100 percent of students to perform at a level of nearing proficient or better), or \$5,428 (which is 4.2 percent less than \$5,664). Given these facts, we suggest setting the base level at \$5,428 in 2001-02..." (page VI-2).
Kansas	Augenblick, Myers, Silverstein, & Barkis (2002)	\$5,811	\$4,547	Either one or use these figures as the min and max base spending	"Both the professional judgment approach and the successful school district approach yielded base cost figures, as discussed in Chapter VI, that could be used in the foundation program component of the Kansas School Finance System...it would be possible to use the lower figure as the foundation level and to use the higher figure as the limit on the second tier (LOB)." (VII-7)
South Dakota	Augenblick, Brown, DeCesare, Myers, & Silverstein (2006)	\$6,362	\$4,717	See Notes.	"It is important to note that the SS approach and PJ approach really are addressing two different standards. In some sense, the SSD base cost represents what districts are spending today on "regular" students to be successful. The PJ base figures represent the resources that panels of educators felt are necessary for districts of varying size to get "regular" students to meet higher performance expectations by 2013." (page 63) The researchers created formulas to create district-specific bases under either approach that varied by district size. Either set of formulas could be adopted.
Tennessee	Augenblick, Palaich and Associates, Inc. (2003b)	\$6,207	\$4,949	Either one or use these figures as the min and max base spending	"One way to reconcile these figures is to: (1) use the lower figure as the base cost immediately; (2) set a schedule to reach the higher figure, plus inflation from 2001-02, by 2013-14; and (3) create an opportunity for districts to meet the higher figure by VI-2 building a "second tier" of state aid that allows districts to generate local revenue and uses

² Two groups of districts were identified as successful using different criteria. In the first, the authors collaborated with the Missouri Department of Elementary and Secondary Education (DESE) to identify districts that had received between 93 and 100 points on the Annual Performance Report (APR) system. The modified group includes districts that meet all of the indicators (score of 100) on the APR.

State	Author (Year)	Professional Judgment Base (unadjusted \$)	Successful Schools/ Districts Base (unadjusted \$)	Recommended Base	Notes
					state aid to “equalize” school districts abilities to generate local revenue between \$4,950 and \$6,200 (plus inflation)... As far as a second tier is concerned, the purpose of such a mechanism is to permit, if not encourage, districts to spend at some level above the base, but not to exceed the professional judgment base cost...” (page VI-1, 2).

Appendix D. Brief Overview of the Standardized Account Cost Structure (SACS)

Similar to systems used by other states, that used by SACS is based upon standards set by the Governmental Accounting Standards Board (GASB) that follow Generally Accepted Accounting Principals (GAAP). Expenditure and revenue line items are identified by five key pieces of information:

- Fund
 - Identifies the fund that is receiving the revenue, paying the expenditure, or otherwise being affected by the transaction. A fund is a fiscal and accounting entity with a self-balancing set of accounts recording cash and other financial resources, all related liabilities, and residual equities and balances or changes therein.
 - Identifies specific activities or defines certain objectives of an LEA in accordance with special regulations, restrictions, or limitations.
 - Examples include general fund, child development fund, and cafeteria special revenue fund.
- Resource
 - Tracks those activities that are funded with revenues that have special accounting or reporting requirements or that are legally restricted.
- Goal
 - Accumulates costs by instructional goals and objectives of an LEA. Groups costs by population, setting, and/or educational mode.
 - Examples include regular education K–12, continuation schools, migrant education, and special education.
 - Allows the charging of instructional costs and support costs directly to the benefiting goals.
 - Provides the framework for accumulating the costs of different functions by goals.
 - Classifies financial information by subject matter and/or mode of education.
- Object
 - Classifies revenues by source and type (e.g., revenue limit sources, federal revenue, other state revenue, fees, and contracts).
 - Classifies expenditures by type of commodity or service (e.g., certificated salaries, classified salaries, employee benefits, books, and supplies).
- Function (Activity)
 - Identifies activities or services performed to support or accomplish one or more goals or objectives.
 - Describes the activity for which a service or material is acquired.
 - Examples include instruction, school administration, pupil transportation, and general administration.

