

School Level Resource Use in Arkansas Following an Adequacy Oriented School Finance Reform

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How is the education dollar used at the local level? How are educational funds used after a school finance reform? These two questions have been asked by policymakers for decades, but have never been answered in detail.

This study analyzes school-level resource use in Arkansas following the implementation of a substantial increase in education funding in response to the state's 2002 Supreme Court order that the state provide adequate and equitable education funding. The new funding model was based on the results of an Evidence-Based school finance adequacy study (Odden, Picus, & Fermanich, 2003). Among the programmatic strategies embedded in the state's new funding model were small class sizes for all elementary grades and core subjects in secondary schools, tutoring resources to help students who were struggling in the regular education program, instructional facilitators or coaches as part of ongoing professional development for teachers, and other educational programs to support student learning.

This study describes how Arkansas schools used all of the funds they received under this funding model in the first years of implementation. What makes this study unique is that it draws from a random sample of schools to assess both how all resources were used, not just how *new* education dollars were used, and how education resources were used by discrete programmatic strategies at the school level. The study joins three streams of research, one on the general use of the education dollar (see Odden & Picus, 2008, Chapter 6), a second on how resources are used after a school finance reform (also see Odden & Picus, 2008, Chapter 6), and a third that provides a framework and methodology for identifying resource use by programmatic strategy at the school level (see Odden, Archibald, Fermanich & Gross, 2003).

Even though the Evidence-Based approach to school finance adequacy embodies an implicit "theory of action" about how to dramatically improve student performance (see Odden, Goetz & Picus, 2008), data were not available to allow this study to link school level resource use patterns to student performance. However, during the presentation of the data, reference will be made to the "theory of action" embedded in the funding model, which will be explicitly described in the discussion section.

Background

In 2000, an Arkansas trial court ruled in *Lake View School District No. 25 v. Huckabee*, (340 Ark. 481, 10 S.W.3d 892 (2000)), that the state failed to equitably and adequately finance its K-12 school system. In November 2002, the Arkansas Supreme Court affirmed the trial court's decision and directed the state to improve the system by January 1, 2004 (*Lake View School District, No. 25 of Phillips County, et al. v. Mike Huckabee, Governor of the State of Arkansas, et al. No 01-836*). In early 2003, the Arkansas legislature hired a consulting firm to conduct an adequacy study using the Evidence-Based approach, one of four "costing out" methods used to determine adequate school funding (see Odden & Picus, 2008). The study's findings were released on September 1, 2003 (Odden, Picus, & Fermanich, 2003). Following its release, the governor called a special legislative session to consider school funding; the session ran from December 2003 to February 2004.

Though the adequacy study included a series of programmatic recommendations for prototypical elementary, middle and high schools, the legislature used the findings to develop a new district-based foundation formula augmented with categorical programs. Arkansas Senator

David Bisbee (2004) authored a memorandum that transformed the detailed school-based recommendations from the adequacy study into a district-level per pupil expenditure amount for a new foundation school finance formula. The memo also created a formula for new categorical programs based on counts and proportions of total school enrollment of students from low income backgrounds (those who receive free and reduced-price lunch) and English language learners. The memo formed the basis of legislation sponsored by Senators Bisbee and Shane Broadway that was eventually enacted into law as Act 59 (State of Arkansas, 84th General Assembly, Second Extraordinary Session) in January 2004.¹

To fund the new program, the legislature raised the sales tax by 0.875 cents, increased the corporate franchise tax and created the Educational Adequacy Trust Fund. This enabled the state to increase the foundation per pupil level from \$4,870 to \$5,400 per student (average daily membership) for the 2004-05 school year and to increase categorical revenues, largely for students eligible for free and reduced-price lunch, from \$10 to \$480 per identified student, and higher for districts with large concentrations of poor students. In particular, as the concentration of students from low income backgrounds increased in a school district, the per pupil amount of the categorical grant doubled when more than 70% of the students qualified for free and reduced-price lunch and tripled when the concentration exceeded 90%.

However, the Legislature and Arkansas Department of Education placed few constraints on local use of the new resources, not only for the funding distributed by the foundation formula but also for the at-risk (free and reduced-price lunch count) student-based categorical aid programs. For example, the 2003 adequacy study proposed that the categorical funds generated on the basis of low-income children be used solely to provide certified teachers for tutoring struggling students. However, when implemented, districts were allowed to use those funds for virtually anything but capital expenses, including higher teacher salaries, lower class sizes and even preschool, despite the fact that funding for these three items was already included in the new funding plan.

Another law enacted during the special legislative session required that the finance system be recalibrated every two years. In 2005, the Adequacy Study Oversight Sub-Committee of the House and Senate Interim Committees on Education of the Arkansas General Assembly commissioned a project to recalibrate the funding formula. In 2006, following a recalibration study conducted by the authors of the first adequacy study, the Arkansas Legislature enacted a somewhat modified funding formula and once again increased the level of funding for schools. In May 2007, the Arkansas Supreme Court held that funding system met the constitutional standards of equity and adequacy and ended the long running *Lake View* case (*Lake View v. Huckabee* Ar. Sup. Ct. No. 01-836, May 31, 2007).

As part of the recalibration effort in 2006, the legislature asked for an analysis of how Arkansas schools were using their revenues, seeking answers to the following four questions:

1. How did the funding level change over time?
2. Were revenues distributed fairly and equitably?
3. How did Arkansas schools use resources at the school level by programmatic strategy?
4. Did local school resource use reflect the programmatic strategies embedded in the funding formula itself?

¹ We should note that the legislature was explicit in stating that the proposed program should be sufficient for all schools and districts, regardless of size, with the implicit suggestion that very small schools and districts were expected to use such revenue levels to meet state standards and if they could not, they should merge with larger districts.

This article answers these questions and contains four sections. Section one discusses the literature within which the research is framed. Section two provides a description of the methodology. Section three provides the findings from our research. Section four discusses those findings in the light of previous literature and includes policy recommendations

We make several comments on the programmatic basis for the Arkansas school funding model before moving to the analysis for this study. First, the Evidence-Based study conducted for the legislature provided an overview of the research supporting each programmatic recommendation. Second, though there is debate in the field as to the power of these recommendations, they do represent a version of what it takes to improve schools and are similar to the resources used by many districts and states across the country that have doubled student performance over the past several years (Odden, Goetz & Picus, 2008). The programmatic elements were reviewed by the interim education committee which voted strongly in support of them, and those programs were the basis of the numbers used in the new funding formula. Third, two large professional judgment panels supported the programmatic recommendations. Fourth, leaders of education organizations testified strongly in favor of the new funding system, for which the programmatic recommendations were the foundation for all numbers and programs. Though there can be and is debate about what it takes programmatically and fiscally to improve student performance, in late 2003 educators and policymakers in Arkansas acted in ways that supported the basic findings of the Evidence-Based study conducted for the state.

Supporting Literature

Analyses of school finance reform can be framed through multiple lenses. Analysis of the equity of the distribution of school resources (Question 2) draws from standard equity frameworks in school finance. For a review of the equity measures and standards traditionally used to answer questions of equity, see Odden and Picus, 2008.

Developing an understanding of how local school districts respond to changes in revenues from the state (Question 3) – and the conditions under which those funds are received – relies both on research on the general use of the education dollar (see Odden & Picus, 2008, Chapter 6) and how resources are used after a school finance reform (also see Odden & Picus, 2008, Chapter 6); we also use a framework and methodology for identifying resource use by programmatic strategy at the school level (see Odden, Archibald, Fermanich & Gross, 2003). We also put this more specific education literature in the broader context of fiscal federalism.

Use of the Education Dollar

This study builds in part on literature describing the typical use of educational resources over time. Data from the past 50 years show that the percent of the education budget spent on instruction has been about 60-61%, even though spending within the instruction function has changed significantly. Over the past 50 years, the bulk of increased instructional resources have been spent on elective classes (art, music, physical education, career-technical classes, etc.), services for special student needs (special education, compensatory and bilingual education, etc.) and instructional aides rather than on core classes such as math, science, history and reading/language arts. In addition, spending on pupil support (guidance counselors, social workers, etc.) has also increased while real teacher salaries have increased only modestly during this time frame (NCES, 2006; Odden & Picus, 2008).

Early studies on the use of educational resources following school finance reform all reached remarkably similar conclusions. For example, Kirst (1977) found that increased funding from California's school finance reform was not used for large teacher salary increases, a legislative concern, but rather for a variety of extra services that were outside the regular classroom. Studies of the impact of the new dollars from 1984 education reforms in a number of states found small but short lived increases in spending on the instructional function (Picus, 1991; Hannaway, McKay & Yakib, 2002).

Studies of the school finance reforms in New Jersey, Texas, and Kentucky in the early 1990s found that funds were initially used for one time expenditures such as construction of new buildings because of fears the new funding would not continue over the long term. Over time, resource use patterns returned to remarkably similar patterns exhibited by school districts before the school finance reforms were implemented (Adams, 1994; Firestone, Goertz, Nagle & Smelkinson, 1994; Picus & Wattenbarger, 1995; Picus, 1994). School districts in all three states increased spending at all levels without adjusting the proportions of spending across functions, resulting in the proportion of funding devoted to instruction staying constant over time.

Most previous research on the use of educational resources relied on district level data; virtually no study was able to identify use of resources at the school level, let alone the use of resources at the school level by programmatic strategy. Yet school level programmatic data were what Arkansas policymakers sought, since it was the basis for the state's new adequacy model. Because Arkansas' education funding was now based on a measure of need (i.e., the evidence-based adequacy model) policy makers wanted to know if school districts responded to this increased aid by using the available revenues in ways identified by the model, even though they did not require them to do so.

Collecting micro-level information on resource use is important because teaching and learning occur at the school-level, and the ultimate goal is to tie educational resource patterns and strategies to school-based strategies linked to student learning. Even today, most fiscal reporting systems mainly provide district-level data. Those data are generally available by object of expenditure and by broad education functions (e.g. instruction, administration, pupil support). Newer data systems report fiscal data at the school-level (Busch & Odden, 1997; Goertz & Odden, 1999; Speakman et al., 1997), but continue to report expenditures by object and function, not by educational program or strategy. And while many systems identify expenditures for personnel and provide personnel counts, none offer data on how those personnel are allocated by educational program at the site.

To address this lack of information about resource use by education program, Odden, Archibald, Fermanich and Gross (2003) developed a school-level expenditure reporting framework to track resource use at the school level by educational program strategies. The categories in the framework were inclusive enough to capture all of the educational strategies used to develop the Arkansas school funding model. Their programmatic framework included seven instructional categories (core academic teachers, specialist and elective teachers, extra help staff such as tutors and resource room instructors, professional development staff and expenditures, other non-classroom instructional staff, instructional materials and equipment, and student support staff) and two non-instructional categories (administration, and operations and maintenance). Because the categories in this school level expenditure framework encompassed all of the educational strategies that were the basis for the new Arkansas education funding model, the framework was used in this study to structure the analysis of how resources in Arkansas were used at the school level by programmatic strategies.

Fiscal Federalism

The broader context for this study is the theory of fiscal federalism (Oates, 1999) which suggests that although an education block grant provided by one level of government to another could serve as a vehicle for fiscal equalization, no prediction can be made about how local districts might choose to use those dollars unless restrictions are imposed on such use. Since the Arkansas Legislature provided most educational resources to local districts with few restrictions on use, legislators should not have expected a common use of those dollars nor should they have been surprised if schools did not use resources according to the implicit, but not mandated, programmatic model on which the new state funding model was based.

Further, Oates (1999) points to the results of Robert Inman's study of the intergovernmental grant system which concludes that a political model, rather than economic theory, may be more accurate in explaining the way recipient governments in the United States, such as schools and school districts in the case of education, choose to use resources from unrestricted grant programs. Use of a political model seems plausible in Arkansas for at least two possible reasons. First, the Arkansas Association of Educational Administrators and other education groups successfully lobbied to keep state aid and categorical funds distributed to school districts largely unconditional, without mandates for specific use. Second, many would argue that the general public pushes to use dollars for lower class sizes, elective courses, and other services for mainstream students, and not directly for the extra needs of students who struggle to meet academic standards.

2. Methodology²

This study is the first statewide study of *school*-level micro-resource use after implementation of a school finance reform. The study was conducted in the spring of 2006, two years after the implementation of a 2004 Arkansas school finance reform, which allowed for some stabilization of resource use patterns.³ Because the results are based on a random sample of schools, the findings are generalizable to schools in Arkansas.⁴ In addition to the detailed analysis of resource use at individual schools, a parallel state level analysis was conducted to assess spending patterns, funding equity and teacher salaries over time. This work is described in detail in Ritter and Barnett (2006), an analysis conducted under the auspices of Lawrence O. Picus and Associates for the Oversight Committee and summarized at the beginning of the results section of this article.

Research Design

² All data for this article are taken from Mangan (2007).

³ Though it could be argued that two years is insufficient time for districts and schools to reallocate resources to a new educational strategy, none of our data collection experts heard mention of this problem during interviews. It seemed that the resource use practices that were reported were indeed the resource use practices desired by those interviewed – superintendents, principals and lead teachers – even though, as the results show, they were different from the underlying rationale for the funding model.

⁴ Again we note that the legislature was not interested in supporting diseconomies of small school or district size lower than that on which the funding model was based, so would view such uses of resources as inefficient and encourage such districts and schools to merge with other entities to use resources in a more efficient manner.

A random statewide sample of 107 schools from a total of 1,106 Arkansas schools serving grades K-12 was selected. The sample size was determined by budget and the need to interpret the findings of the study within a 95% confidence level. Fifty-five elementary, 17 middle, and 35 high schools were identified, with a 100% participation rate. The sample included 48,132 students of a total of 463,922 students.

The randomly-selected sample produced student and school demographics that paralleled the state's K-12 student population during the 2005-06 school year (see Table 1). The racial composition of the students in the school sample was close to all students in Arkansas, with a slightly lower percentage of Asian, Hispanic and White students and a slightly higher proportion of African American and Native American students. Additional comparisons of students in the sample to the total population of students in Arkansas reveal similar percentages of students who are eligible for free or reduced-price lunch (about 50%), are identified as having a disability (approximately 12%), and who are identified as English language learners (roughly 5%).

Table 1

Characteristics of Student Demographics in Arkansas and the Sample

Student Demographic	Percent of Students In Arkansas	Percent of Students In Sample Schools
Native American	0.66	0.45
Asian	1.39	1.63
Hispanic	6.73	7.85
African American	22.76	19.60
White	68.47	70.48
Students Eligible for Free or Reduced-Price Lunch (FRL)	54.04	48.60
Students with Disabilities	11.97	11.93
English Language Learners (ELL)	4.40	5.69

*Totals may not sum to 100 due to rounding

During 2005-06, school size in Arkansas ranged from 83 to 2,104 students, with a mean of 450 and a median of 397 students per school. A comparison of school size in the sample to all the schools in Arkansas revealed similar patterns (see Table 2).

Table 2

Percent of Schools by Enrollment Categories in Arkansas and the Sample

Number Of Students Per School	Percent of Schools In Arkansas	Percent of Schools In The Sample
<100	5	2
101-249	21	21
250-349	21	17

350-499	25	27
>500	29	33
TOTAL*	100	100

*Totals may not sum to 100 due to rounding

The type of schools in the sample (elementary, middle, and high schools) also followed similar trends to the composition of statewide schools (see Table 3). Elementary schools comprise about half of all the schools, high schools comprise about one-third of the schools, and middle schools make up the balance. Overall, the randomized school sample closely mirrored the student demographics and characteristics of schools in the state.

Table 3

Percent of Schools by School Level in Arkansas and the Sample

School Level	Percent of Schools In Arkansas	Percent of Schools In Sample
Elementary	55.15	51.40
Middle	16.64	14.95
High	28.12	33.64
Unit (PK-12)	0.09	0.00
TOTAL*	100.00	100.00

*Totals may not sum to 100 due to rounding

Instruments

The data collection instruments included interview protocols and corresponding codebooks. The instruments were developed as revised versions of data elements gleaned from the School Expenditure Structure (Odden, Archibald, et al., 2003) (see Table 4) and the Professional Development Cost Framework (Odden, Archibald, Fermanich, & Gallagher, 2002) (see Table 5).

The School Expenditure Structure first provides indicators of the characteristics of the school and non-fiscal resource patterns (e.g. length of the instructional day and school periods, minutes formally allocated to core subjects, sizes of core content classes). It then identifies categories of how staff could be used by major programmatic strategies within a school such as for core subjects (i.e., math, science, history, reading/language arts, foreign language), electives (e.g. art, music, physical education), instructional support, pupil support (e.g. guidance counselors), programs to provide extra help to struggling students (including tutoring, extended day and summer programs, pull out resource room assistance), and school and district administration.

This School Expenditure Structure was field tested in the Cost of Instructional Improvement Study (Odden, Goertz, et al., 2008). In Arkansas, the data collection protocol was used in each school during an in-person interview with the school principal and selected teachers. In some schools the district superintendent also participated in the interview. Interviewers and interviewees were provided with definitions of all data elements in a detailed codebook, which was largely drawn from the School Expenditure Structure framework (see

Table 4). Before undertaking the interviews, the framework was revised to tailor all elements to the Arkansas context.

The professional development data items were revised from the Professional Development Cost Framework (Odden et al., 2002; see Table 5), with two additional data items added as “other” to accommodate any additional professional development expenditure elements identified by the schools.

The data collection protocol also captured district resource variables. Average salary and benefit data were included for teacher, principal, assistant principal, instructional aides, and secretary positions. The final section of the data collection protocol used grids to record individual class sizes. One grid organized the classes by subject for middle and high schools, and a second by grade for elementary schools.

Table 4
School Expenditure Framework and Resource Indicators

School Resource Indicators	
School Building Size	Length of Reading Class (Elementary)
School Unit Size	Length of Mathematics Class (Elementary)
Percent Low Income	Reading Class Size (Elementary)
Percent Special Education	Mathematics Class Size (Elementary)
Percent ESL/LEP	Regular Class Size (Elementary)
Expenditures Per Pupil	Length of Core* Class Periods (Secondary)
Professional Development	Core Class Size (Secondary)
Expenditures Per Teacher	Non-Core Class Size (Secondary)
Special Academic Focus of School/Unit	Percent Core Teachers
Length of Instructional Day	
Length of Class Periods	*Math, English/LA, Science, & Social Studies

School Expenditure Structure

Instructional

1. Core Academic Teachers

- English/ Reading/ Language Arts
- History/ Social Studies
- Math
- Science

2. Specialist and Elective Teachers/Planning and Preparation

- Art, music, physical education, etc.
- Academic Focus with or without Special Funding
- Career/ technical/vocational
- Drivers Education, Librarians

3. Extra Help

- Tutors
- Extra Help Laboratories
- Resource Rooms (Title I, special education or other part-day pull-out programs)
- Inclusion Teachers
- English as a second language classes
- Special Education self-contained classes for severely disabled students (Including aides)
- Extended Day and Summer School
- District-Initiated Alternative Programs

4. Professional Development

- Teacher Time – Substitutes and Stipends
- Trainers and Coaches
- Administration
- Materials, Equipment and Facilities
- Travel & Transportation

	- Tuition and Conference Fees
Instructional	5. Other Non-Classroom Instructional Staff - Coordinators and Teachers on Special Assignment - Building Substitutes and Other Substitutes - Instructional Aides 6. Instructional Materials and Equipment - Supplies, Materials and Equipment - Computers (hardware, software, peripherals) 7. Student Support - Counselors, Nurses, Psychologists, Social Workers, Extra-Curricular and Athletics
Non-Instructional	8. Administration 9. Operations and Maintenance - Custodial, Utilities, Security, Food Service

Table reprinted from Odden, Archibald, Fermanich and Gross, (2003).

Table 5
A Cost Structure for Professional Development

Cost Element	Ingredient	How Cost is Calculated
Teacher Time Used for Professional Development	<i>Time within the regular contract:</i>	
	-when students are not present before or after school or on scheduled in-service days, half days or early release days	teachers' hourly salary times the number of student free hours used for pd
	-planning time	the cost of the portion of the salary of the person used to cover the teachers' class during planning time used for pd
	<i>Time Outside the regular day/year:</i>	
	-time after school, on weekends or for summer institutes	- the stipends or additional pay based on the hourly rate that teachers receive to compensate them for their time
	-release time provided by substitutes	- substitute wages
Training and Coaching	<i>Training</i>	
	-salaries for district trainers	sum of trainer salaries
	-outside consultants who provide training; may be part of CSRD	consultant fees or comprehensive school design contract fees
	<i>Coaching</i>	
	-salaries for district coaches including on-site facilitators	sum of coach and facilitator salaries
	-outside consultants who provide coaching; may be part of CSRD	consultant fees or comprehensive school design contract fees
Administration of Professional Development	Salaries for district or school level administrators of professional development programs	salary for administrators times the proportion of their time spent administering pd programs
Materials, Equipment and Facilities Used for Professional	Materials	materials for pd, including the cost of classroom materials required for CSRDs
	Equipment	equipment needed for pd activities

Development	Facilities	rental or other costs for facilities used for professional development
Travel and Transportation for Professional Development	Travel	Costs of travel to off-site pd activities
	Transportation	Costs of transportation within the district for professional development
Tuition and Conference Fees	Tuition	Tuition payments or reimbursement for university-based pd
	Conference Fees	Fees for conferences related to pd

Table reprinted from Odden, Archibald, Fermanich, and Gallagher, (2002).

Procedures

Twelve data collectors were trained over two days in January 2006 and collected resource data via in-person interviews with principals, teachers and superintendents between February and April 2006. The training focused in part on coding book that provided directions for how were to be arrayed by program strategy; the coding required data collectors to determine how staff fit into the coding scheme, regardless of specific title for the school or district. Data collectors also analyzed school and district budgets to supplement the interviews. Data were collected on full-time equivalent (FTE) staff positions, as well as on expenditures for professional development. Staff lists were typically used to determine the number of FTEs in each school. Each data collector worked with the principal (and other interviewees) to ensure there was a comprehensive list of all the staff in the school as well as the district staff who provided direct services to that school. Interviewees also helped the data collectors ensure the accuracy of budgetary data. We also collected data on total compensation levels for employees (salary and benefits). Data were then entered into a common database, which was coordinated and cleaned by the study manager.

Data Analysis

The goal for the analysis was to compare the resource use choices districts and schools made for 2005-06 to the staffing ratios that under girded the foundation level and categorical programs that comprised the state's new school finance program. Though the analysis was at the school level, most of the resource use decisions were made by districts, as very few districts in Arkansas used a school-based budgeting or management system.

Analysis Procedures. Frequencies, averages, ranges, full-time equivalent counts of staff, and ratios of staff to students encompassed the majority of the analytic procedures. Once we determined the number of staff at each school, we computed a staffing ratio by dividing the number of staff by the number of pupils in the school. These staffing ratios were then compared to the funding components used in the development of Act 59.

To further understand how resources were used in the schools we undertook a number of additional analyses. First we conducted a comparison of the number of instructional aides at each school. Because the model does not fund instructional aides, this figure was computed to highlight the existence of aide positions used in the schools that were not included in the state funding formula. Second, we computed the number of tutors each school would generate based on counts of free and reduced-price lunch eligible children (recall that as the concentration of

these children increases, funding for aide positions is increased as well) and compared that to the actual number of tutors found in each school. Third, we used data from high school class schedules to estimate the percentages of class types (e.g. core, electives) that were taught. These percentages offer a picture of how resources were allocated by class type.⁵

3. Results

This section has three parts. The first offers a district level assessment of the level and change in the use of resources over time. This includes an assessment of the equity of the distribution of those resources. The second part discusses resource indicators at the school level, initially for the total sample of study schools and then disaggregated by school level – elementary, middle and high school. Part three reviews school resource use patterns, primarily through an analysis of staff by programmatic categories. School level staffing patterns are described and compared to the resources used to generate revenues for each school through the Arkansas funding model.

Level of Resources and Distributional Equity⁶

The 2004 school finance adequacy reforms substantially increased Arkansas school funding (Ritter & Barnett, 2006). From 2003-04 (prior to passage of Act 59) to 2004-05, Arkansas increased general revenues for schools from \$3,237 to \$3,834 per pupil, a 19.2% increase in average foundation state aid per pupil. In 2005-06, Arkansas further increased general revenues to \$3,859 per pupil. Coupled with a 5.5% increase in local revenue from the required 25 mills tax rate, the total foundation revenue increased from \$4,755 to \$5,424 per pupil between 2003-04 and 2004-05, a 14.9% increase. Total foundation revenue rose an additional 2% to \$5,534 for 2005-06. State categorical revenue rose significantly from \$49 to \$422 per pupil⁷ after the school finance reform. Other state revenue slightly increased from \$440 to \$442 per pupil. Including increases in local revenue above the 25 mills tax rate, federal revenue, and other revenue, total revenue increased from \$7,696 to \$8,902 per pupil in 2004-05 for a one year increase of 16.5%, and then rose again to \$9,431 or 5.9% per pupil for 2005-06. Total funding increased by 22.5% between 2003-04 and 2005-06.

These changes in funding also produced a more equitable distribution of revenues to school districts. Specifically, the coefficient of variation (CV) for non-categorical dollars decreased from 0.07 in 2003-04 to 0.06 in 2004-05. Both numbers are under the 0.10 standard, and indicate that education funding in Arkansas became more uniformly distributed among all districts (Ritter & Barnett, 2006).

In addition, per-pupil revenues were not linked to wealth. The wealth elasticity dropped from 0.12 in 2003-04 to 0.09 in 2004-05, more than meeting the standard of 0.10 and indicating a weakening of the relationship between local property wealth per pupil and revenues per pupil (Ritter & Barnett, 2006).

⁵ We note again that the study sought to answer the legislative question of whether resources were used according to the programs used as the basis for the funding model. Though some might question those programmatic strategies, the legislature had accepted them and sought information on whether actual use patterns were aligned with them.

⁶ The data from this section are taken from Ritter and Barnett (2006), a study conducted under the auspices of Lawrence O. Picus and Associates for the overall analysis for the Oversight Committee.

⁷ The amounts were substantially larger for the students targeted for categorical program services.

School resources were further targeted to district needs. In 2004-05 Ritter and Barnett found that districts with the highest percentage of students from low-income backgrounds had both higher levels of spending, and had experienced the greatest increases in per pupil expenditures between 2003-04 and 2004-05. Specifically, in 2004-05, the highest poverty districts spent \$8,166 per pupil (a 15% increase from the previous year), and the lowest poverty districts spent \$6,457 per pupil (an almost 12% increase from the previous year) (Ritter & Barnett, 2006).

Resources were also targeted to districts with the highest percentage of minority students. In 2004-05, the highest minority districts spent \$7,878 per pupil (a 15% increase from the previous year), and the lowest minority districts spent \$6,868 per pupil (an almost 13% increase from the previous year).

Districts with a higher percentage of students failing Arkansas' state tests, the Arkansas Comprehensive Testing, Assessment and Accountability Program (ACTAAP), spent more than districts with a higher percentage of proficient students (Ritter & Barnett, 2006). In 2004-05, districts with the highest percentage of failing students spent an average of \$7,895 per pupil (a 14% increase from the previous year), and districts with the highest percentage of passing students spent an average of \$6,774 (an 11% increase from the previous year).

Overall, districts with students that had the most needs received more resources than districts with fewer needs. Further, these higher need districts also received slightly higher percentage revenue increases than their counterparts, which contributed to the state's commitment to vertical equity.

Although revenues were more equally and equitably distributed following Act 59, the way districts chose to allocate those funds across functions did not change. The expectation of the Legislature in enacting Act 59 was that a higher percentage of school district dollars would be devoted to instruction. Instead, spending increased equally across all expenditure categories and the share devoted to each function remained the same (see Table 6).

Table 6
Changes in Expenditure Categories as a Percent of the Overall Budget

Expenditure Type	Per Pupil, 2003-04	% of Overall Budget, 2003-04	Per Pupil, 2004-05	% of Overall Budget, 2004-05
Instruction	\$4,093	62	\$4,604	62
Instructional Support	\$316	5	\$395	5
Pupil Support	\$293	4	\$325	4
Site Administration	\$374	6	\$413	6
Central Administration	\$288	4	\$304	4
Maintenance & Operations	\$619	9	\$676	9
Transportation	\$242	4	\$271	4
Food & Other	\$354	5	\$405	5
Total Current Expenditures	\$6,579	100	\$7,395	100

Note: Analysis is of current expenditures and not revenues, and also excludes desegregation funds.
Source: Ritter, G. & Barnett, J. (2006).

The adequacy study recommended that virtually all new dollars be directed toward instruction and instructional services, yet the first year the new funding system was in place, less

than two-thirds of the new money available to schools was spent on instruction.⁸ Act 59 did not intend to increase funding for central administration, operations and maintenance, transportation, and food, yet almost one-fifth of the new dollars were spent in those categories.

Ritter and Barnett (2006) also found that beginning teacher salaries increased from \$27,380 in 2003-04 to \$30,070 in 2004-05 (an increase of almost 10%), while average teacher salaries increased from \$39,409 in 2003-04 to \$41,489 (a 5.3% increase) in 2004-05. In 2005-06, average certified classroom teacher salaries further rose to \$43,088, a 3.8% increase from the previous year. Increasing teacher salaries was one of the legislative objectives in implementing the reforms.

These findings were encouraging to legislators who wanted a more equal allocation of funds for base funding across districts and categorical dollars targeted to special student needs. However, they do not provide information on how the use of dollars at individual schools relates to the funding model used to determine the foundation level and categorical grant money each district received. We report our school level findings below.

School Level Resource Use

To understand how the sample schools in Arkansas used the resources available to them through the new funding mechanism, we first report our findings on the use of time in the schools. We follow that with a discussion on how staff resources were deployed in the sample schools, comparing actual staffing to the staffing provided by the funding model.

Use of Time

At both elementary secondary schools, the average school day was approximately seven hours with six of those devoted to instruction. The instructional day is defined as the school day minus time for lunch, recess, and passing periods.

During daily instructional time, teachers spent an average of 71 minutes instructing elementary students in mathematics and an average of 1 hour and 55 minutes for reading, with a school-level minimum of one hour and a maximum of 3 hours and 30 minutes.

In terms of time devoted to specific secondary school subjects, teachers spent an average of 56 minutes instructing students in mathematics as well as English and language arts. Science and social studies classes at the secondary level mirrored daily mathematics and reading instructional lengths, making the overall time spent in those four core content areas about the same.⁹

Use of Staff Resources in Schools

This section explores staff resource use elements that reflect the core components of school resource use. Expenditures for instructional materials and equipment are not included in the discussion as the study was unable to collect these figures

⁸ This finding aligns with previous studies of the use of school finance reform dollars in the first year after the reform. The findings could be due to many factors. But the legislature hoped that proportionately more new funds would be used for instructional purposes but the findings suggested that they were not, at least in 2004-05.

⁹ Instructional time in science and social studies classes was not collected at the elementary level, therefore it is not possible to estimate the amount of daily instructional time devoted to core content areas.

In order to provide a comprehensive picture of actual staffing resources in schools compared to the staffing resources provided by the state funding model, staff allocations are reported as both the total number of staff and the average full-time equivalencies (FTEs). To set the context of this comparison, it is important to reiterate that the average school size in the study is 450 students. In contrast, the state funding model is based on a school size of 500 students (even though the average school size of all 1,106 schools in the state was 419 students in the 2005-06 school year). Therefore, staffing allocations that are 1.0 FTE (or one full-time position) in the funding model will calculate to 0.9 FTE in the 450 student average school. In other words, the staffing formulas that under gird the state funding model for a prototypical school of 500 students have been “fitted” to the actual sizes of the average school in this study. For example, if the funding model provided core teachers at the rate of one for every 20 students, which is equivalent to 25 teachers for the 500 student school, that formula would provide 22.5 teachers (450 divided by 20) for the average school size of 450 students in the study.¹⁰

Average school resource use. Table 7 compares the FTE positions that would be generated in a school of 450 students (the average size of our sample schools) under the Arkansas adequacy model, with the actual FTE staff allocations we observed in the 107 sample schools.

Table 7

Average School-Level Resource in Full-Time Staff Equivalencies (FTEs)

Staffing	State Funding Model for a 450 student school	Actual
Principals	0.90	0.97
Assistant Principals	0.00	0.58
Instructional Facilitators	2.25	0.44
Core Teachers	18.66	18.57
Specialist/Elective Teachers	3.73	7.53
Instructional Aides	0.00	1.23
Certified Tutors	2.69	0.32 ^a
Librarians	0.63	0.94
Pupil Support Staff	2.25	3.17
Secretaries	1.80	1.51
TOTAL	30.66	33.43

^aCertified tutors providing service to groups of more than five students are not included in this number; Average non-certified tutors (0.2) also is not included.

¹⁰ Because principal and sometimes other staff salaries are lower in smaller schools, even a 0.9 FTE allocation from the funding model, priced at the state average salary, could be adequate to hire a *full time* principal in a school smaller than the 500 student school that was the basis of calculation for the funding model.

Table 7 shows that school staff resources for many positions, including principals, core teachers (math, science, language arts and history), and secretaries, were present in the schools at close to the same level as the funding model. On the other hand, other actual staffing categories differed from those in the funding model. For example, though the state provided resources for 2.25 instructional facilitator positions for this average school, the average school only had about a half of an instructional facilitator or coach position. Coaches are an element of professional development that is key to improving teacher's instructional practice. Likewise, though the finance formula provided 2.7 certified teacher tutors for this average school, we found that schools only employed about 1/3 of an FTE tutor position. These tutors were meant to be the initial, intensive extra help strategy for struggling students,

Schools employed almost twice as many elective (specialist) teacher positions (7.5) as provided through the funding model (3.7). They also employed substantial numbers of instructional aides, even though the model provided no funding for these positions (except for special education and those aide positions are not included in Table 7). Table 7 also shows that the sample schools had more pupil support staff (guidance counselors, social workers, nurses, etc.) than was provided by the model -- 3.17 actual positions compared to 2.25 positions in the funding model. Finally, the sample schools employed a 0.58 assistant principal position, while the funding model did not fund an assistant principal position for a school of this size.

In sum, we found all schools on average in the sample used the dollars from the funding model to staff schools in different ways than assumed by the funding model. The average school hired about the same number of core teachers and secretaries. But, it had fewer instructional coaches and teacher tutors, the prime elements in the funding model intended to strengthen professional development and to help struggling students learn to standards. The average school also had more administrators (principals and assistant principals), more elective (specialist) teachers, more pupil support staff and more instructional aides.

Resource use by school level. Tables 8, 9 and 10 disaggregate resource use by school level -- elementary, middle, and high school. As described below, the results continue to illustrate differences between the staffing configuration undergirding the funding model and actual staffing configurations in the elementary, middle and high schools in the sample. The data in these tables also include more categories of staff to more specifically illustrate those resource use differences.

The data show that schools at all three levels were staffed with more administrative positions than provided for in the funding model. All levels of schools had close to a full time principal, plus assistant principal positions.

Perhaps a better way to analyze school site administrators is to add the principal and assistant principal FTEs together to get a measure of total administrative positions at the schools site. Although assistant principal positions were not funded explicitly through the model, a large school would have been provided with funds for more than one principal position, and those additional funds appropriately could have been used for assistant principal positions. All three tables show, however, that schools had more administrative staff than provided by the funding model.

Table 8**Average Elementary School Resource Use in Full-Time Equivalencies (FTEs)**

Expenditure Element	Staffing Category	State Funding Model	Actual
Administration	Principals	0.75	0.98
	Assistant Principals	0.00	0.35
	Technology Coordinators	0.00	0.23
	Other Administration	0.00	0.06
	Secretaries	1.5	1.20
	Clerical Staff	0.00	0.46
Core Academic Teachers	Core Teachers	16.31	18.32
Specialist Staff	Specialist/Elective Teachers	3.26	2.36
	Librarians	1.07 ^a	0.95
	Library Aides	0.00	0.33
Extra Help	Certified Tutors	2.95	0.33
	Non-Certified Tutors	0.00	0.35
	Special Education Teachers I ^b	2.17	1.08
	Special Education Teachers II ^c	Eligible for Full Funding ^d	0.61
	Special Education Aides I ^b	0.00	0.97
	Special Education Aides II ^c	Eligible for Full Funding ^d	1.10
	ELL Teachers	0.13	0.27
	ELL Aides	0.00	0.21
	Other Extra Help Teachers	0.00	1.36
	Other Extra Help Aides	0.00	1.16
	Professional Development	Instructional Facilitators	1.88
Other Staff	Other Instructional Aides	0.00	1.82
	Other Classified Staff	0.00	0.16
	Other Teachers	0.00	0.03
	Supervisory Aides	0.66	1.07
Student Support	Pupil Support Staff	1.88 ^e	3.10
Operations & Maintenance	Security	? ^f	0.08
	Custodians and Maintenance	? ^f	2.45
TOTAL	ALL STAFF^g	34.27^g	39.35^g

^aThis is the average 0.7 librarians per 500 students, not the 0 for grades K-5; 1 for grade 6-8; 1.5 for grades 9-12.

^bThese special education teachers and aides provide inclusion and resource room services.

^cThese special education teachers and aides provide one-to-one services or instruct in self-contained classrooms.

^dCosts for students with severe and profound disabilities are eligible for reimbursement from the catastrophic fund.

^eThis is the average 2.5 pupil support per 500 students, not the 0 for K-3; 1 for grades 4-8; 2 for grades 9-12.

^fThe operations and maintenance staff positions are embedded with other expenditures in the carry forward of the foundation amount, so they cannot be individually calculated.

^gThis total includes all staff members except for those funded through the carry forward.

Table 9**Average Middle School Resource Use in Full-Time Equivalencies (FTEs)**

Expenditure Element	Staffing Category	State Funding Model	Actual
Administration	Principals	0.88	0.97
	Assistant Principals	0.00	0.76
	Technology Coordinators	0.00	0.33
	Other Administration	0.00	0.33
	Secretaries	1.76	1.60
	Clerical Staff	0.00	0.48
Core Academic Teachers	Core Teachers	17.59	18.26
Specialist Staff	Specialist/Elective Teachers	3.52	7.89
	Librarians	1.26 ^a	0.91
	Library Aides	0.00	0.39
Extra Help	Certified Tutors	1.95	0.38
	Non-Certified Tutors	0.00	0.07
	Special Education Teachers I ^b	2.55	1.82
	Special Education Teachers II ^c	Eligible for Full Funding ^d	1.07
	Special Education Aides I ^b	0.00	1.61
	Special Education Aides II ^c	Eligible for Full Funding ^d	0.97
	ELL Teachers	0.04	0.12
	ELL Aides	0.00	0.06
	Other Extra Help Teachers	0.00	0.74
	Other Extra Help Aides	0.00	0.15
	Professional Development	Instructional Facilitators	2.20
Other Staff	Other Instructional Aides	0.00	0.95
	Other Classified Staff	0.00	0.27
	Other Teachers	0.00	0.00
	Supervisory Aides	0.78	0.26
Student Support	Pupil Support Staff	2.20 ^e	2.84
Operations & Maintenance	Security	? ^f	0.42
	Custodians and Maintenance	? ^f	3.04
TOTAL	ALL STAFF^g	36.77^g	43.57^g

^aThis is the average 0.7 librarians per 500 students, not the 0 for grades K-5; 1 for grade 6-8; 1.5 for grades 9-12

^bThese special education teachers and aides provide inclusion and resource room services.

^cThese special education teachers and aides provide one-to-one services or instruct in self-contained classrooms.

^dThe costs for students with severe and profound disabilities are eligible for reimbursement from the catastrophic fund.

^eThis is the average 2.5 pupil support per 500 students, not the 0 for K-3; 1 for grades 4-8; 2 for grades 9-12.

^fThe operations and maintenance staff positions are embedded with other expenditures in the carry forward of the foundation amount, so they cannot be individually calculated.

^gThis total includes all staff except for those funded through the carry forward.

Table 10**Average High School Resource Use in Full-Time Equivalencies (FTEs)**

Expenditure Element	Staffing Category	State Funding Model	Actual
Administration	Principals	1.14	0.95
	Assistant Principals	0.00	0.88
	Technology Coordinators	0.00	0.42
	Other Administration	0.00	0.48
	Secretaries	2.29	1.90
	Clerical Staff	0.00	1.14
Core Academic Teachers	Core Teachers	22.88	19.10
Specialist Staff	Specialist/Elective Teachers	4.58	15.47
	Librarians	1.63 ^a	0.93
	Library Aides	0.00	0.34
Extra Help	Certified Tutors	2.57	0.26
	Non-Certified Tutors	0.00	0.02
	Special Education Teachers I ^b	3.32	2.96
	Special Education Teachers II ^c	Eligible for Full Funding ^d	0.61
	Special Education Aides I ^b	0.00	1.06
	Special Education Aides II ^c	Eligible for Full Funding ^d	1.02
	ELL Teachers	0.13	0.27
	ELL Aides	0.00	0.19
	Other Extra Help Teachers	0.00	0.71
	Other Extra Help Aides	0.00	0.29
	Professional Development	Instructional Facilitators	2.86
Other Staff	Other Instructional Aides	0.00	0.43
	Other Classified Staff	0.00	0.20
	Other Teachers	0.00	0.17
	Supervisory Aides	1.01	0.72
Student Support	Pupil Support Staff	2.86 ^e	3.44
Operations & Maintenance	Security	? ^f	0.45
	Custodians and Maintenance	? ^f	4.43
TOTAL	ALL STAFF^g	46.9^g	54.34^g

^aThis is the average 0.7 librarians per 500 students, not the 0 for grades K-5; 1 for grade 6-8; 1.5 for grades 9-12.

^bThese special education teachers and aides provide inclusion and resource room services.

^cThese special education teachers and aides provide one-to-one services or instruct in self-contained classrooms.

^dCosts for students with severe and profound disabilities are eligible for reimbursement from the catastrophic fund.

^eThis is the average 2.5 pupil support per 500 students, not the 0 for K-3; 1 for grades 4-8; 2 for grades 9-12.

^fThe operations and maintenance staff positions are embedded with other expenditures in the carry forward of the foundation amount, so they cannot be individually calculated.

^gThis total includes all staff except for those funded through the carry forward.

Elementary schools tended to hire more core teachers than the funding model provided; middle schools slightly more and high schools fewer core teachers than the funding model. The results suggest that the preference for districts was to have smaller core classes in grades K-8 and larger core classes in high schools, conclusions which are further illustrated by Table 11, which shows the ratio of students to core teachers in the schools studied (column 3) in comparison to that included in the funding model (column 2). Table 11 also shows the range of students per core teacher varied for each level, suggesting that actual practice varied a considerably.

Table 11

Ratio of Students per Core Teacher by School Level

School Level	State Funding Model	Actual
Elementary	23:1 ^a	Average 20:1 Range (13-24):1
Middle	25:1	Average 24:1 Range (11-35):1
High	25:1	Average 30:1 Range (10-41):1

^aPupil:teacher ratios at the elementary-level are funded at 20:1 for kindergarten students, 23:1 for first through third grade students, and 25:1 for grades 4-6. An average of 23:1 is provided here for comparison with actual teachers, which are not broken down by specific grade level.

Combined, these results reveal that districts provided proportionally more core teachers at the elementary and middle school levels and proportionally less core teachers at the high schools. However, as Table 12 shows, the total number of core teachers hired across all school levels was approximately equal to the number included in the funding model; local districts simply allocated such positions somewhat differently across school levels (see Table 12).

Table 12. Number of Actual and Funded Core Academic Teachers by School Level

School Level	State Funding Model	Actual
Elementary	897	1,007
Middle	299	310
High	801	669
TOTAL	1,997	1,986

Tables 8, 9 and 10 show that elementary schools employed only 2.33 elective teachers versus 3.33 such positions that were included in the funding model. On the other hand, middle schools had more than twice the number of elective teachers than were funded by the model (7.89 versus 3.52), and high schools more than triple the number of elective teachers than provided by the model (15.47 versus 4.58). If the prime goals of the education system are to teach more students to higher levels of performance in the core subjects – mathematics, science, language arts/reading/writing, geography and history, this actual allocation of resources is curious. The findings nevertheless show that in practice, secondary schools are provided a level of elective staff that far exceeded that provided by the funding model.

For high schools, these findings and their possible misalignment with the core goals become possibly more curious when viewing the actual classes taught. Data collected on actual high school class subject periods in the spring of 2006 revealed that only 47% of high school classes were in the core content academic areas of mathematics, science, history, and language arts (see Table 13). More than half (53%) of all class periods were not in the core subjects. Of those non-core classes, career and technical classes comprised 16% of all classes, which is more than any individual core subject. These trends may partially be a result of the Arkansas high school standards which require 38 units to be taught annually including nine career and technical, six language arts, six mathematics, five science, and four social studies units (Arkansas Department of Education, 2005). Further, 12% of high school students took an athletics class (e.g. football or basketball practice) *during the regular school day* in addition to their physical education class. So in a six period day, a student could take physical education and count the first hour of sports practice as an elective class. That left four classes for instruction, not all of which would be core classes. Clearly, electives garnered a considerable amount of resources at the high school level.

Table 13 Percent of Class Periods in High Schools by Content Area

Content Area	Percent of Total Class Periods (%)	Percent of Classes Required by State Standards (%)
English/Language Arts	14	16
Math	12	16
Science	11	13
History	10	11
Career and Technical	16	24
Other Electives	37	21
TOTAL	100	100

School level resources for struggling students. The funding model provided additional resources for struggling students. This included resources to provide additional education services for children with mild and moderate disabilities (and assumes programs for children with severe disabilities are fully state funded), as well as programs for English Language Learners (ELL) and children who qualify for free and reduced-price lunch.

All school levels staffed their inclusion and resource rooms for special education at lower levels than the model funded. Elementary schools allocated one full position less than the funding model (see Table 8), middle schools allocated about three-quarters of a position less (see Table 9), and high schools allocated approximately one-third of a position less than funded by the state (see Table 10). At the same time, the schools hired a significant number of aides and additional teachers teaching special education in self-contained classrooms above the model's funding levels.

Table 14 details these findings by showing the current allocation of all special education teachers and aides included in the state funding model, compared to the numbers actually provided. The data show that schools hired about the same number of special education teachers overall but 118 additional teacher aide positions.

Table 14. Number of Actual and Funded Special Education Teachers and Aides

Severity of Student Disability	State Funding Model		Actual	
	Teachers	Aides	Teachers	Aides
Mild or Moderate	279	0	194	118
Severe and Profound	Fully Funded	Fully Funded	87	111
TOTAL	279+	0+	281	229

Schools at all levels provided ELL teachers and aides at much higher levels than funded (Tables 8, 9 and 10). For schools with at least one ELL student, there were an average of 0.22 ELL teachers and 0.23 ELL aides compared to the average 0.11 ELL teachers that would be funded for these schools. For the 2,823 ELL students in the schools studied, there were two times more actual ELL teachers and significantly more aides than the state categorical aid funds. Of the 66 schools that enrolled at least one ELL student, 29 schools staffed ELL teachers and 20 schools staffed ELL aides. The “tipping point” for all schools to provide ELL staff occurred when the ELL students reached a critical mass of 77 students. When ELL enrollments were less than 77, there was no consistent staffing pattern discernable among the sample schools. Overall, only about half of the schools with ELL students employed ELL teachers, and those that chose to do so provided the positions at a higher ratio than was funded by state categorical dollars. These numbers include migrant aides.

Elementary and high schools employed, on average, about two and a half fewer certified tutor positions than provided by the funding model (see Tables 8 and 10) while middle schools had about one and a half fewer positions (see Table 9). Elementary schools used non-certified tutor positions at a higher frequency than the secondary schools. As further shown by Table 15, there were relatively few certified teacher tutors (35) in the schools we studied. Even if non-certified tutors (21) are included in the computation, the percentage of tutors only increases from 6% to 10% of the number of positions funded through the model. Further, the 2003 adequacy report recommended a minimum of one teacher tutor per school, and only 12% of the schools met this criterion.¹¹

Table 15. Number of Funded and Actual Tutors by Student Poverty Level

Poverty Concentration	State Categorical Distributions ^a	Actual Certified Tutors	Actual Non-Certified Tutors
< 70%	1 Teacher for Every 100 FRL Students = 177	18	16
70-89%	2 Teachers for Every 100 FRL Students = 93	15	5
≥90%	3 Teachers for Every 100 FRL Students = 18	2	<1
TOTAL	288	35	21

^aNSL funds may be used for tutors or one of numerous other approved programs.

¹¹ One could argue that finding teacher tutors in the second year of implementation might be difficult because it takes time to train such individuals, but in other research we have found that schools can turn multiple former positions, such as a Title I reading specialist, into a tutor position if tutoring is a core part of the school’s new education improvement strategy (Odden & Archibld, 2001). Data collectors, moreover, did not hear many comments about the desire for having more tutors but not being able to find them in the teacher labor market.

In sum, schools provided more staff resources for special education and ELL students but less tutoring staff for struggling students. Local priorities for staffing services for struggling students differed from the assumptions and parameters of the funding model.

Professional development. The other staffing category that was significantly understaffed compared to the state funding model was instructional facilitators or coaches. Conceptually, instructional facilitators are part of the instructional support team of the school and a key element of its professional development strategy. These individuals support the school's instructional program by helping teachers acquire and deploy new pedagogical strategies via coaching and mentoring in the classroom. On average, elementary schools had 74% fewer instructional facilitators than were funded (Table 8) and secondary schools about 86% fewer facilitators (Tables 9 and 10). None of the school-level averages reached even a half-time instructional facilitator.

Pupil support and instructional aides. Pupil support was a category that all schools staffed in excess of the state funding model. Elementary schools provided an average of 65% more pupil support staff than was funded (Table 8) whereas middle and high schools, on average, provided 29 and 20% more respectively (Tables 9 and 10). The choice to provide more pupil support staff than the model funds could be an indication that the model under funds this staff component. Alternatively, it could be that when combined with the under funding of instructional facilitators it represents a theory of instruction that to successfully improve student learning, it is more important to support students in coping with non-educational issues undermining their school work than it is to support teachers to improve instruction.

As noted above, the state funding model did not provide resources for regular education instructional aides. Nevertheless, schools hired an average of 1.23 instructional aide positions and 0.19 classified staff in addition to the other instructional aides and classified staff reported in previous sections of this chapter. Specifically, these instructional aides included in-school suspension staff, regular classroom aides, computer lab aides, and Title I inclusion aides.

Discussion

This article represents a new and different kind of school finance study of resource use practices. First, the unit of analysis was the school, not the district. Second, rather than analyze state collected, school level financial data from standardized reports, this study relied on analysis of data from 107 randomly selected schools in Arkansas, using interviews with administrators and teachers to determine how time and staff resources were used at the school by program strategy. Third, the data were collected in the fourth semester following the implementation of a major school finance reform in Arkansas, giving schools and districts at least three semesters for finding new staff or reassigning staff from old to new positions. This enabled researchers to compare the actual use of resources in each school with the adequacy model used to estimate the level of staffing resources schools needed to help students dramatically improve academic performance. Fourth, while most school finance studies analyze allocations of dollars across broad functions, most of this analysis focused on what the dollars bought in terms of the allocation of time for instruction and the use of personnel across various educational programs and strategies for that overall instructional strategy. This is a major shift in thinking about school finance and represents a different approach to answering the question of what the money buys. We hope that this approach will help researchers further discover the link between resources and student learning.

There are multiple findings from the research. First, Arkansas provided school districts more resources in response to the court mandate to adequately fund the schools. Moreover, those resources were distributed in ways that reduced the link between local property wealth per pupil and school district revenues, and simultaneously targeted dollars to districts with higher needs as measured by the numbers of students from poverty background, minority status or low test scores. In other words, the state provided more funds, distributed them more equitably and targeted total resources to student need, thus making substantial improvements to the equity and adequacy of its overall school finance system – precisely what the court mandated. These are significant and positive findings.

Second, though not explicitly discussed above, Arkansas’s mandate for full-day kindergarten in every district continued to be implemented with relatively low class sizes, keeping them on the cutting edge of early childhood best practices. The study confirmed that full-day kindergarten continued to be a fully-implemented educational policy with an average class size of 18.47 students compared to a formal funding ratio of 20:1.

Third, schools were staffed in patterns that differed in important ways from the model under girding the new funding structure. As indicated above, because the state set no explicit rules for using the new resources, fiscal federalism would predict this finding. However, there were patterns in local resource use practices:

- All schools provided more administrative resources than the funding model offered, a practice that was more pronounced at the secondary school level. On average, each sample school had one principal and one assistant principal position, while the funding model included resources only for the principal.
- Class sizes were different from the funding model. In primary grades (first through third) class sizes were lower than used in the Arkansas funding model. The state-determined foundation amount included a 23:1 pupil-to-teacher ratio for grades 1-3, whereas actual practice revealed a lower average pupil-to-teacher ratio of 20.43:1. However, these lower numbers came in part at the cost of higher class sizes in high schools, 30, compared to the 25 provided for in the funding model. Though there could be different views on whether these variances are appropriate, they do show that class sizes in elementary and high schools were different than in the funding model.
- Staffing to provide extra help for struggling students was also different. The Evidence Based study recommended additional resources for 1-1 or small group tutoring, as the most effective extra help strategy. But schools used substantially fewer certified tutors than were funded in the model, and considerably more instructional aides – many of whom had classroom responsibilities that differed from helping struggling students grasp the classroom curriculum.
- The study also found that schools had about 50% more pupil support staff (about 3 rather than 2) than provided by the funding model.
- Schools also employed fewer teacher resources for students with disabilities (focusing here on the high incidence but lower cost disabilities because the state fully funded programs for children with severe and profound disabilities). This occurred even though the census funding for these categories of disabilities (2.9 staff for every 500 students) was by no means overly generous.
- Schools also differed from the funding model in their approach to professional development. A core component of the funding model was instructional facilitators or coaches as part of an effective professional development strategy. The coaches’ or

facilitators' role is to help teachers improve their daily instructional practices to ensure students receive the best possible instruction. Instructional coaches were funded at the rate of 1 coach for every 200 students, yet the study found few schools with this level of support for teachers. The under-use of instructional coaches could erode the effectiveness of professional development practices in Arkansas schools.

- The results also show that although the state's education reforms were focused on higher levels of achievement in core subjects, especially at the high school level, a large portion of time, staff and classes were devoted to non-core elective classes. Only 47% of high school classes were in the core content academic areas of math, science, history, and language arts and more than half (53%) of all class periods were devoted to career and technical classes and electives. Middle schools also provided more staffing for elective classes than provided by the funding model.

The study results show that fiscal federalism lives. Schools did not use the resources in the implicit ways included in the funding formula. Actual resource use differed from resources in the model for administration, core classes, elective classes, pupil support staff, special education, extra help for students struggling to learn to standards, and professional development. Moreover, despite the funding model's emphasis on professional staff instead of paraprofessional and classified staff, most schools chose to continue to employ paraprofessionals and classified staff for functions the model suggested should be staffed by certificated professionals. Whether this pattern will change over time or not is impossible to predict from one year of data. Whatever the specific patterns of different resource use, fiscal federalism predicts that absent constraints or restrictions, it would be unlikely for schools to use resources in a way that was implicitly embedded in the funding formula.

However, it is clear that there were patterns to local resource use and staffing of schools. The actual use of resources reflects general patterns of resource use that has developed over the past fifty years: 1) less of a focus on core subjects, 2) a strong preference for elective classes especially in middle and high schools, 3) heavy use of instructional aides, 4) strong emphasis on pupil support staff to address non-academic issues of students, and 5) weak professional development (see Odden & Picus, Chapter 6).

It could be argued that the choices made by districts and schools in allocating the resources available to them represent a theory of educational improvement that differs from the theory embedded in the Odden, Picus and Fermanich (2003) adequacy study, upon which the funding model was based. The theory of improvement embedded in the adequacy model (Odden, Goetz & Picus, 2008) is that if the core goal of the Arkansas system is improved student achievement in core subjects (mathematics, science, language arts/writing/reading, geography and history), then:

- 1) time for core subjects should be maximized
- 2) more staff and classes should be provided for core content classes and less emphasis should be given to elective, career and technical education classes
- 3) instructional practice should be improved via intensive and ongoing professional development including school-based instructional coaches as a critical component of this strategy, and
- 4) students struggling to achieve to proficiency in core subjects should be provided a sequence of extra instructional help beginning with tutoring provided by certified teachers.

It could be argued that actual resource use practice represents a different theory of improvement, one that suggests the way to improve Arkansas schools is to:

- 1) provide more administration
- 2) provide more elective classes to motivate students to exert effort to learn core subjects
- 3) use more para-professional instructional aide staff than certified teacher staff in providing extra help to struggling students, and
- 4) help students address the non-educational issues impacting their ability to learn with more pupil support staff more than improving instructional practice with intensive professional development staff.

These are considerably different theories of school improvement. Neither has been proven or not proved by this study, but they raise questions that need to be answered both about actual staff resource use and the staffing embedded in the funding model. One could argue that the latter theory reflects the more political view of local resources use articulated by Inman (in Oates, 1999) in that the public might lobby for small class sizes, more electives and resources to “fix” students, even though standards-based education reform supports a focus on core subjects, bolstered by intensive, ongoing professional development and multiple extra help strategies to hold performance goals constant but modify instructional time to help all students achieve to proficiency.

At the same time, several of the findings suggest that the funding model might need some change. For example, schools provided more staffing resources to serve ELL students than was provided by the funding model. They also relied on more school site administrative personnel than the model funded, and employed higher numbers of pupil support staff than recommended by the 2003 adequacy study.

It could be argued that our findings raise more questions than answers. The fact is as just noted, school use of personnel and fiscal resources in Arkansas today follow the more traditional use of education dollars in America generally (see Odden and Picus, 2008), and this differs considerably from the resource use practices embedded in the Arkansas funding model. To fully understand which approach to resource use is more effective, further study including analysis of resource use patterns in schools that have dramatically improved student performance, and comparisons of resource use patterns in those schools with the way the schools we studied in Arkansas actually used resources would be needed. Both of those studies should also include schools that chose to allocate resources in ways that closely match the parameters of the funding model. To ensure the most effective and efficient resource use over time, the state will need to identify which strategies and resource use patterns in Arkansas schools are associated with improved student performance, and calibrate the funding model accordingly. This research also suggests that if the state wants to ensure schools implement these resource use patterns, restrictions on how funds are used may need to be put in place.

Finally, our findings could be enhanced in the future by coupling this work with an in-depth exploration of instructional improvement strategies at the school-level. By developing a comprehensive understanding of resources at the school-level, and tying that to the curriculum and instruction programs that have been successful in schools, it may be possible to develop a much stronger understanding of how school resources and student learning are linked. Such a study would collect data on what is already working in Arkansas schools and pair it with the resources necessary to achieve those results. Arkansas is in the unique position of having the first statewide randomized-sample study of school-level resources. The state has the opportunity to further the research agenda to contribute to the instructional improvement literature, as well as to offer schools information on models that are working to improve teaching and learning.

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