

# CURRENT LEVELS OF STUDENT ACHIEVEMENT IN MISSISSIPPI

*Kathleen Sullivan and Marianne Hill\**

Education in the United States is undergoing intense scrutiny as the country struggles to maintain and raise U.S. standards of living in the new global economy. In Mississippi, where most students are achieving at levels below the U.S. average, the challenge facing education is even more formidable. This article examines the extent of the problem in the state, through considering indicators of student achievement.

## Introduction

Results of locally administered literacy tests show serious deficiencies in basic skills among about 40 percent of the Mississippi eleventh graders who were tested, a group that does not include over 10,000 students who dropped out of school prior to reaching the eleventh grade. Mississippi students taking the college entrance examinations administered by the American College Testing Program on average are also achieving at levels below the U.S. norm. In this

article, data from the state Functional Literacy Examination and from the recently discontinued Basic Skills Assessment Program are used to assess student achievement as are Mississippi test scores on the American College Testing Program's examination (ACT), the Stanford Achievement Test, and the Armed Forces Qualifying Test. While these tests have limitations, they do indicate reasons for concern, despite recent progress in education in the state.

## The National ACT Examination

In 1989 Mississippi ranked last among the 28 states in which the American College Testing Program's ACT examination was the primary college entrance test taken by college-bound students. Seventy percent of Mississippi students taking the exam scored below the national average (see Table 1). For particular groups, such as African-Americans, the gap from the national norm was even greater. In addition, the

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Table 1.  
**SCORES OF MISSISSIPPI STUDENTS ON THE ACT EXAMINATION IN COMPARISON TO U.S. MEAN, 1989, BY RACE<sup>1</sup>**

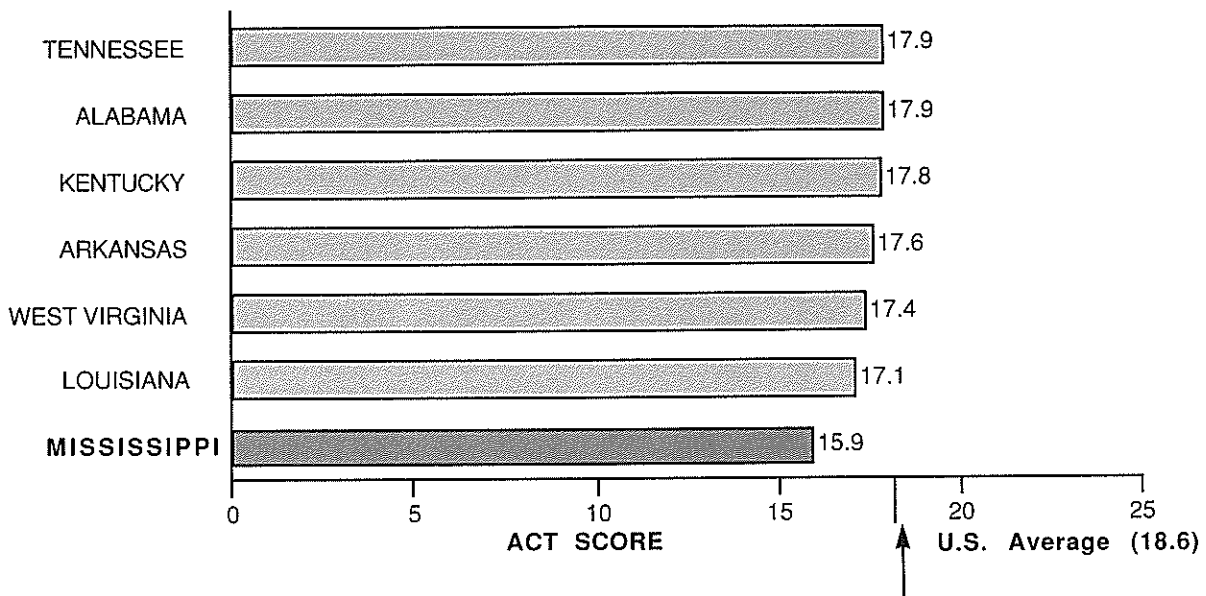
	<u>Percent Scoring Above Mean</u>	<u>Percent Scoring Below Mean</u>
<b>Total</b>	<b>30</b>	<b>70</b>
Caucasian	39	61
African-American	13	87
Other	25	75

<sup>1</sup> The U.S. mean score for high school graduates was 18.6; 63 percent of Caucasian and 90 percent of African-American high school graduates in the state scored below 19. Extrapolation yielded the figures presented. Students taking both core and non-core classes are aggregated in this table.

SOURCE: ACT, *Special ACT Assessment Reference Norms, Mississippi and the Nation, 1989.*

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Figure 1-1.  
**AVERAGE 1989 ACT SCORE FOR SOUTHERN STATES**



The states shown are among the twenty-eight in which the American College Testing program examination is the test taken by most college-bound high school students.

SOURCE: State Policy Research, *State in Profile, 1992*.

size of the gap varied considerably by subject matter, with the state's performance in natural science and mathematics being the weakest.

Mississippi achieved a much higher rank in comparison with other states, however, when score increases between 1982 and 1989 are considered. In a 50-state comparison of increases in achievement on the test taken by the most college-bound students in each state (the ACT or the Scholastic Aptitude Test) Mississippi's 2.6 percent rate of change was the tenth highest in the nation, according to the U.S. Department of Education. Achievement in 12 states declined or failed to show any improvement over the same period.

In 1989 a breakdown of Mississippi's ACT scores by subject area, sex, and ethnic background was provided by the ACT, along with comparable data on the U.S. as a whole.<sup>1</sup> Overall, 70 percent of students scored below the

national mean, but the figures worsen when individual groups are considered. African-Americans in particular were found to be underachieving, with about 90 percent of African-Americans taking the core curriculum (college preparatory classes) here scoring below the national average of all high school students taking such core courses. A similar percentage of African-Americans taking non-core courses (89 percent) also scored below the national average of those taking non-core courses. By contrast about 63 percent of whites (Caucasians) taking core or non-core courses score below the national norm.

When subject area is considered, Mississippi's showing in the natural sciences was the least satisfactory, with 75 percent of students taking core curriculum classes scoring below the national average; for mathematics the percentage was 70 percent, for social sciences 68 percent,

Table 2.

**ACT SCORES OF MISSISSIPPI STUDENTS IN COMPARISON TO U.S. MEAN, BY SUBJECT AREA, FOR STUDENTS TAKING CORE COURSES<sup>1</sup>**

	<u>Percent Scoring Above Mean</u>	<u>Percent Scoring Below Mean</u>
English	41	59
Mathematics	30	70
Social Studies	32	68
Natural Science	25	75
<b>Total</b>	<b>27</b>	<b>73</b>

<sup>1</sup> The national means were: English 20.1, mathematics 20.2, social studies 19.5, natural science 23.3, and composite 20.9. In Mississippi, 59 percent of students scored below 20 in English, 70 percent below 20 in mathematics, 70 percent below 20 in social studies, 74 percent below 23 in natural science, and 74 percent below 21 in the composite. Extrapolation yielded the figures presented.

SOURCE: ACT, *Special ACT Assessment Reference Norms, Mississippi and the Nation, 1989.*

and for English 59 percent. Women scored higher than men in English, but somewhat lower in the other subjects. The difference in male/female scores was no higher in Mississippi than in the rest of the country, with women taking core courses scoring about 6 percent lower than the men. The black/white difference in scores was also about the same as that found in the rest of the country, African-Americans scoring about 28 percent below Caucasians. This is similar to the size of the gap between U.S. and Japanese high school students that has been found in some international examinations, as discussed in the section on international comparisons.

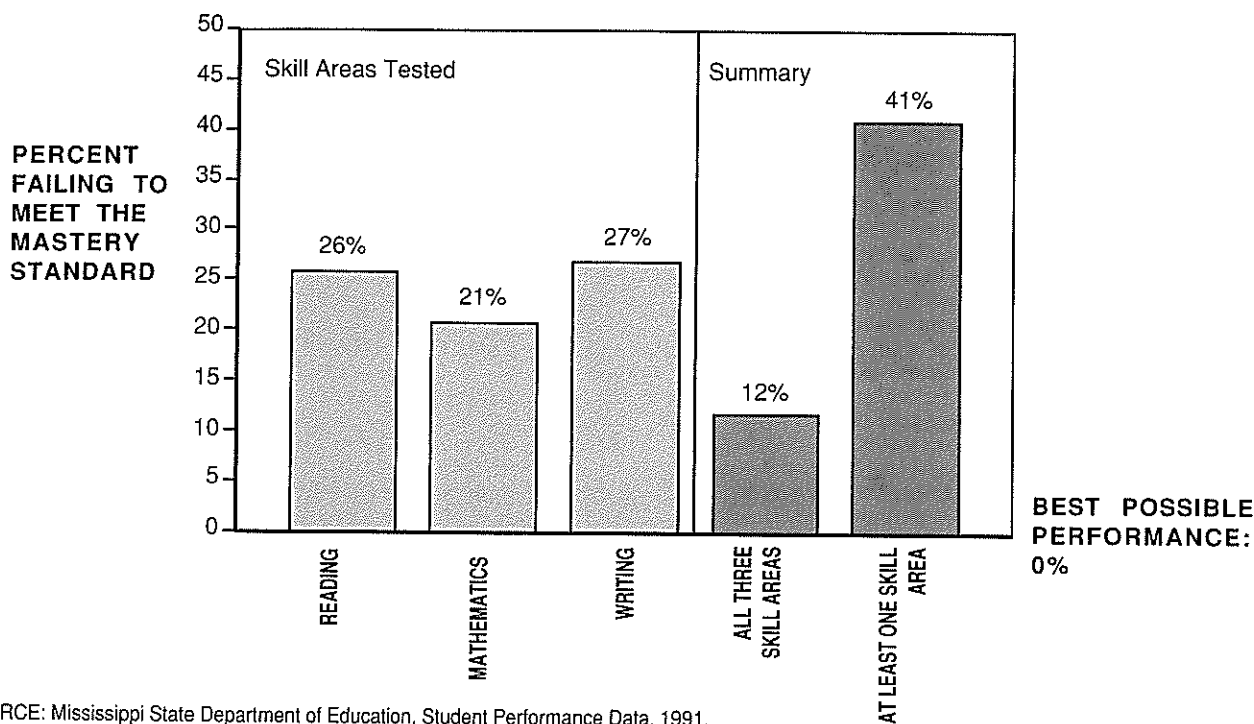
#### **Functional Literacy Testing**

Ensuring that youth acquire basic skills remains a major challenge in the state. If the number of 16- and 17-year olds who should have taken the Functional Literacy Examination (FLE) in spring 1991 is assumed equal to the number of students who entered the school system 11 years earlier in the fall of 1980, only about 39 percent of all 16- and 17-year olds had taken and passed

all subtests of this examination at the suggested competency level as of spring 1991.

The functional literacy test, which the Mississippi Department of Education developed in response to the mandate of the 1982 Education Reform Act, is administered to all eleventh graders and is used to measure students' mastery of basic skills in reading, math, and written communication. School districts' average FLE performance is one factor used by the State Board of Education to determine the district's accreditation status. The Commission on School Accreditation, upon recommendation of the teachers and researchers who developed the test, established 80 percent correct as the performance level representing mastery of the subject matter tested for purposes of accreditation.<sup>2</sup> As the figure below indicates, 41 percent of the 1991 eleventh graders taking the test failed to meet this standard on at least one subtest of this exam, and, as noted earlier, at least this many students dropped out of school prior to taking the exam. The 25,744 students who took the FLE in spring 1991 represent 92 percent of the students

Figure 1-2.  
**PERCENT OF ELEVENTH GRADERS FAILING TO MEET MASTERY STANDARD ON FUNCTIONAL LITERACY TEST, SPRING 1991**



SOURCE: Mississippi State Department of Education, Student Performance Data, 1991.

enrolling in the eleventh grade in fall 1990; 70 percent of the 36,909 students who entered the ninth grade in fall 1988 (the year this class was in ninth grade); and only 65 percent of the 39,398 enrolling in first grade in fall 1980. Only 15,176 of those taking the test passed in all three skill areas tested, using the standard established by the Commission on Accreditation. This suggests that only 39 percent (15,176 divided by 39,398) of the 16- and 17-year olds who entered first grade in a public school in fall 1980 were tested and found functionally literate by the eleventh grade.

In addition to its use for accreditation purposes, the FLE is used to determine individual students' eligibility for graduation. The board's standards for eligibility to graduate are considerably lower than the 80 percent correct criterion established for district accreditation purposes. The board uses a 70 percent correct criterion on the FLE for graduation, but a student

can receive credit for mastery with even less than 70 percent correct on a given subtest as long as a composite scaled score for the three subtests (reading, math, and written communication) is equivalent to 70 percent correct. A student may actually score as low as 60 percent correct on one of the subtests, as long as his or her composite score is high enough.

In 1991, 95 percent of Mississippi students taking the test achieved the 70 percent composite FLE score needed to graduate. This figure represents 62 percent of the students entering first grade in fall 1980.

#### **Basic Skills Assessment Program**

The Mississippi Department of Education developed the Basic Skills Assessment Program (BSAP) to measure student mastery of basic skills at the third-, fifth-, and eighth-grade levels. The results of the BSAP/FLE tests in 1990-91 are presented in Table 3. This table shows the number and percent of students achieving

mastery of the skills listed, as defined by the Mississippi Commission on School Accreditation (80 percent or more of the test items answered correctly). As that table indicates, the lowest performance was seen among eighth graders, more than half of whom failed to demonstrate mastery in at least one of the basic skill areas tested. More than one-third of the eighth graders failed to meet the mastery criterion for basic skills in math and 41 percent failed to reach the mastery criterion in reading. The criteria for mastery set for BSAP was determined by the PEER Committee to be lenient compared with expected eighth grade performance level for the national Stanford Achievement Test.<sup>3</sup> While the majority of students taking BSAP demonstrated mastery of the skills tested, according to these criteria, serious problems were revealed by these tests, with a growing percentage of students

affected as grade levels advance.

In 1992, after using the BSAP/FLE series of tests for four years, the Board of Education eliminated the BSAP tests at the third-, fifth- and eighth-grade levels, and retained only the FLE.

The board eliminated the BSAP series because it was concerned that the program was not measuring (and may have been drawing attention away from) higher-order thinking skills. The board intends to develop or acquire more "authentic" tests that capture the complex skills and knowledge students will need to function effectively as thinking, problem-solving adults.

Mississippi students' apparent difficulty in demonstrating mastery of basic skills in reading, composition, and computation suggests a need for the Department of Education to continue monitoring of students' mastery of the fundamentals skills.

Table 3.  
**PROPORTION OF STUDENTS FAILING TESTS OF BASIC SKILLS IN ACADEMIC YEAR 1990-91<sup>1</sup>**

	Percent Below Mastery In Reading	Percent Below Mastery In Math	Percent Below Mastery In Writing	Percent Below Mastery in All Three	Percent Below Mastery in One Area
BSAP - Grade 3	7.6%	10.0%	14.0%	3.7%	19.1%
BSAP - Grade 5	23.5	26.4	26.7	12.1	40.4
BSAP - Grade 8	41.2	36.1	17.3	13.0	51.3
FLE - Grade 11	26.5	21.2	27.5	11.6	41.1
Average percent below mastery	24.0%	23.2%	20.8%	9.9%	37.3%

<sup>1</sup> Based on mastery criterion of 80 percent correct.

BSAP = Basic Skills Assessment Program  
 FLE = Functional Literacy Examination

SOURCE: State Department of Education student performance data for school year 1990-91.

**The Stanford Achievement Test**

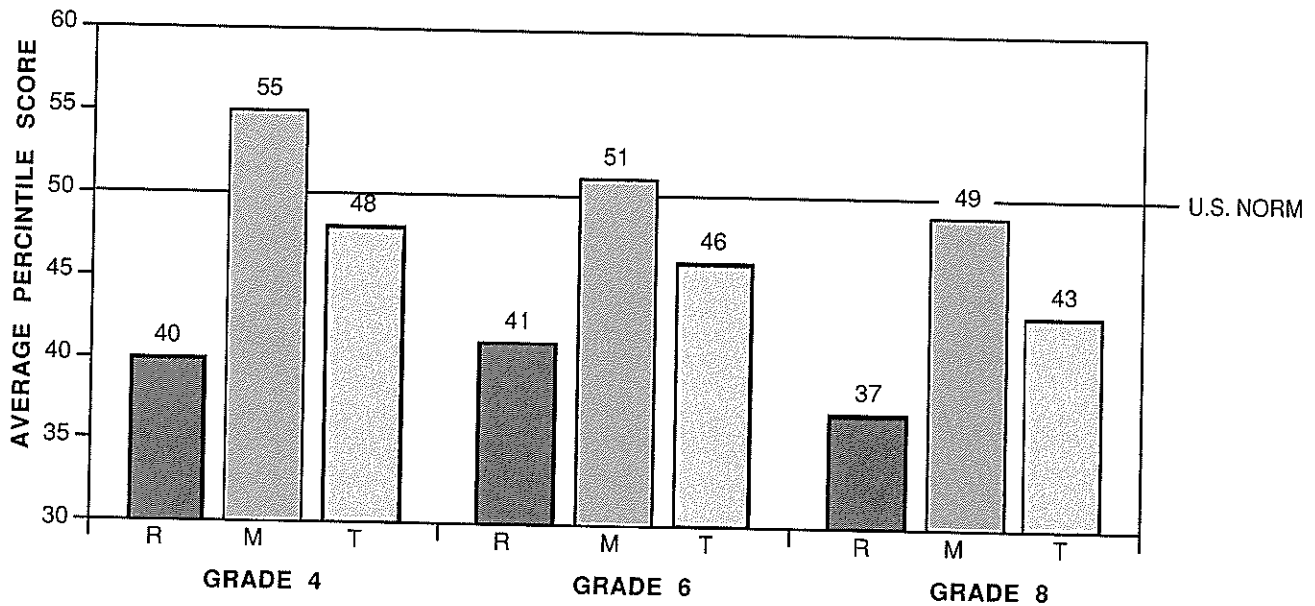
The Stanford Achievement Test was introduced to primary schools in Mississippi in response to the 1982 Education Reform Act. The Stanford can be used to compare a district's average score on a specific subtest and grade level with the achievement of a national sample of students (a "norm group") at the same primary grade level -- fourth, sixth, or eighth grade. In recent years Mississippi has scored near or above the national norm in mathematics and language, and below the national norm in science, social science, and reading, with the greatest shortfall in reading. As Figure 3 indicates, in spring 1992 Mississippi students scored slightly higher than average in language at all grade levels, and in mathematics scores were close to or above the national norm. However, reading scores were considerably lower than the norm, and pulled

down the overall percentile rating of the state to below the national norm in each grade level. The composite scores also include the results on the science and social science sections, which for all grades were below the language and mathematics scores, but above the reading results. Results declined steadily as grade levels rose.

Student performance varies considerably by district and by school, and also within schools. The information available on Stanford Achievement Test performance also is not sufficient to compare the performance of the lowest, average, and highest performers over time, whether by school, district or in the state as a whole.

However, some breakdown of scores is available at the district and school level. Average composite scores by school make it clear that

Figure 1-3.  
**STANFORD ACHIEVEMENT TEST SCORES: MISSISSIPPI AVERAGE PERCENTILE COMPARED TO U.S. NORM, SPRING 1992.**



R = Reading  
 M = Mathematics  
 T = Total Battery including language, science and social science.

SOURCE: Mississippi State Department of Education, *Summary Report For 1992, Statewide Testing Program, 1992.*

although low income levels generally have an adverse impact on student achievement, there are some cases where students in poorer districts outperform their better-off neighbors. For example, Holmes County had a per capita income of \$9,442 in 1990 versus the state average of \$12,830 yet in 1991 and 1992 the nearly 1000 students in this school district who took the test scored close to the national norm in their composite scores, with ratings above other more affluent districts and above the state averages, except for the fourth grade in 1992. Per-student expenditure in the district was 3 percent below the state average.

The distribution of scores across districts is in agreement with studies showing that factors other than per capita incomes or expenditure per pupil can have a critical impact on school outcomes. While in some cases the unusual success of particular schools or districts may be due to individual skills and talents that cannot be replicated by others, there are also likely to be instances of programs and practices deserving wider attention across the state. In the future, results of a federally sponsored testing program, the National Assessment of Education Progress (NAEP), will also be available to aid in assessing student achievement. Mississippi participated in

this program in 1991-92, testing eighth graders statewide.<sup>4</sup>

#### Armed Forces Qualifying Test

Candidates for enlistment in the U. S. armed forces must take the Armed Forces Qualifying Test (AFQT). Only those scoring above the 10th percentile are eligible for enlistment and each of the services actually requires a score higher than the 10th percentile for recruitment. In recent years, the proportion of test takers failing to reach the 10th percentile has been diminishing, in part because recruiters apparently are screening out individuals who are unlikely to achieve the required score.

Table 4 shows the percentage of Mississippi residents and the percentage from other states who scored below the service-wide cutoff (10th percentile of a selected national sample) from 1989 through 1992. As that table indicates, Mississippi residents were 1.8 times as likely to score below the cutoff than were test takers from other states. By 1992, the likelihood of a Mississippi resident failing to reach the cutoff decreased in absolute terms, but increased in relation to other U. S. citizens to a level 2.3 times higher than the failure rate of test takers from other states.

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Table 4.  
**MISSISSIPPI PERFORMANCE ON ARMED FORCES QUALIFYING TEST:  
 PERCENTAGE SCORING BELOW 10TH PERCENTILE MINIMUM  
 FY1989-92**

<u>Fiscal Year</u>	<u>Percent of MS Test Scores &lt;10</u>	<u>Percent of All Other Test Scores &lt;10</u>	<u>Number in MS Taking the AFQT</u>
1989	6.6	3.6	15,711
1990	6.1	3.3	13,319
1991	5.5	2.9	10,513
1992	4.9	2.1	9,431

Note: FY1992 data available through August only. Nationally 670,565 persons took the test in FY1991.

SOURCE: Data provided to Mississippi Legislative PEER Committee by the United States Military Entrance Processing Command (USMEPCOM).

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### **High School Completion Rates, 1974-1991**

Another measure of educational outcome is the proportion of the adult population with at least 12 years of schooling. Census data show that between 1950 and 1990 the proportion of Mississippi adults with a high school diploma rose almost 300 percent, from 21.5 to 64.3 percent. For the U.S., the comparable increase was from 34.3 percent to 75.2 percent.

The high school completion rate for a specific cohort (a group of students born in the state in a given year) is another educational outcome indicator. No reliable data exist on a national or state level to measure precisely what proportion of a cohort enters first grade six years after birth and completes high school 12 years later. Many children enter and leave a state and its public school districts prior to and throughout a cohort's 12 or 13 years of schooling. Further, those enrolled in private schools never show up in the state's enrollment figures. Although some improvement in data on dropouts is planned, precision is not possible at present. However, the number of spring graduates as a percent of the ninth grade enrollment four years earlier is a useful measure that is commonly employed to gauge high school completion.

High school graduates as a percent of the fall enrollment four years earlier has remained close to 60 percent for almost 20 years, with some substantial improvement for a while in the late 1980s. Sixty-one percent of the students entering ninth grade in fall 1970 graduated in the spring of 1974. Beginning in 1981, a slow climb began which peaked at 68 percent in 1988, then dropped back to 64 percent in 1990 and to 61 percent in 1991. That is, approximately 39 percent of the number entering ninth grade did not graduate in 1991. Also important is the percentage of a total cohort that leaves the public school system before the cohort enters ninth grade. An example can be seen in the cohort that graduated in 1991. Of the 44,139 children born in 1973, 40,638 entered first grade in a public school six years later. The number enrolling in ninth grade in fall 1987 is 6

percent lower than the number entering the first grade in fall 1979. The number graduating in 1991 (23,504) was approximately 58 percent of the number from that cohort who had enrolled in first grade. Thus, approximately 42 percent of the students who entered first grade were not accounted for in the state's 1991 graduation figures, although inclusion of students who transferred to and graduated from private schools after beginning first grade in public school would improve this figure somewhat: about 13.5 percent of 1980 Mississippi high school graduates graduated from private schools, while 9.5 percent of total students enrolled at that time were in private schools. (Comprehensive data on private school enrollment and graduations are not maintained by the state.)

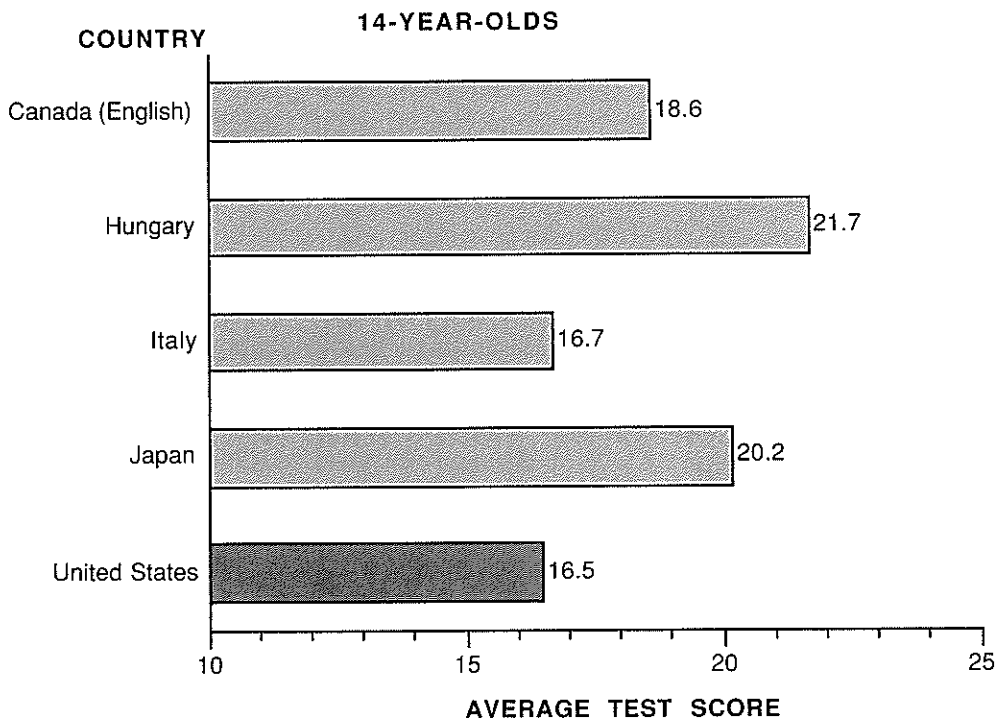
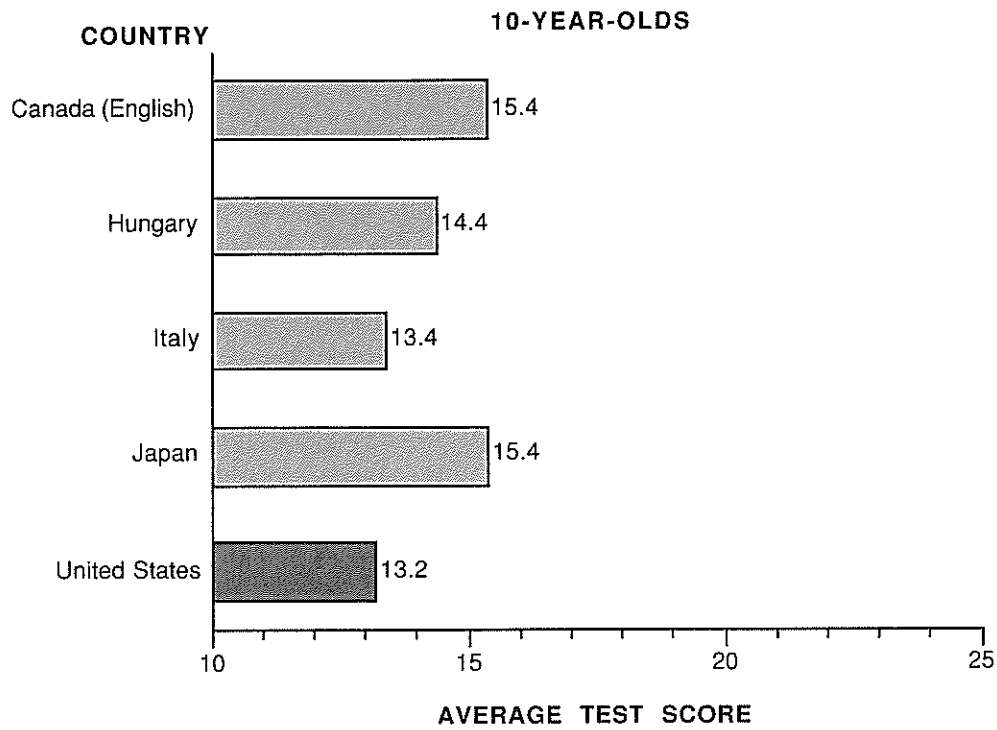
### **Academic Achievement of U. S. Students Internationally**

International studies comparing the mathematics and science achievement of U.S. students with the performance of students in other industrialized countries include the First and Second International Mathematics Studies, conducted in the 1960s and 1980s, and the first and second International Assessments of Educational Progress, conducted in 1988 and 1991. In those studies U. S. students performed poorly in comparison with students in Japan, Korea, Taiwan, and Germany. Figure 4 provides some data. Note that the gap between U.S. scores and those of other countries increases at the higher grade levels.

Problems exist with the statistical sampling methods of the studies performed prior to 1991: that is, test takers may not be representative of school age population, and researchers have urged caution in interpreting results. However, the consistency of the results of these international studies may permit looking beyond their methodological flaws to conclude that, in general, U.S. students tested in these studies perform at lower levels than students in at least Japan, Germany, Korea, and Taiwan.



Figure 1-4.  
SCIENCE TEST SCORES IN SELECTED COUNTRIES: 1983 TO 1986



Tests were conducted between 1983 and 1986.

SOURCE: International Association for the Evaluation of Educational Achievement, *Science Achievement in Seventeen Countries, A Preliminary Report*.  
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## Conclusions

Despite the increased attention devoted to education since 1980, achievement levels in Mississippi remain disappointingly low. The majority of 17-year-olds apparently lack basic literacy skills in at least one area, based on the results of the state's Functional Literacy Examination and on some plausible assumptions about dropouts. Nationally administered examinations at the primary level show a significant gap between the Mississippi average and the national norm, which widens noticeably between the fourth and eighth grades on the Stanford Achievement Test. On the American College Testing examination the gap between Mississippi and the nation is similar, with Mississippi having the lowest average score of any state in which the ACT is the college entrance examination taken by most college-bound students in the state.

The problem of Mississippi students' low achievement is particularly serious when seen in the context of the rising educational levels in other countries. U.S. students regularly rank below those in several other countries on examinations designed to compare achievement levels among countries.

If Mississippi students' academic achievement consistently lags behind most other states in the U.S., and if the U.S. trails several other industrialized countries, Mississippi cannot expect to thrive in a world where competition for jobs and economic development are increasingly global.

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\*The authors wish to thank the many individuals in the State Department of Education who provided data. The views expressed, however, are solely those of the authors.

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## NOTES

1. The percentages reported were estimated from data on mean scores and percentiles, e.g. 69 percent of Mississippians scored below 20 and 74 percent scored below 21 on the ACT, so that overall about 73 percent scored below the national mean of 20.9.
2. Note that the commission established interim standards lower than the 80 percent correct standard to allow districts time to work toward meeting the requirement that students answer an average of 80 percent of the test items correctly as an accreditation requirement.
3. To determine whether the BSAP test might have been too difficult for eighth graders, PEER compared the performance of the same eighth graders on the BSAP and the Stanford Achievement Test (PEER, 1992). The expected performance level for these students would be at least 8.8 (eighth month of eighth grade) if BSAP had measured eighth-grade minimum reading and math competency skills. Using only the data from eighth-grade students who met the 80 percent criterion on BSAP, PEER found that 37 percent of the students who had passed the BSAP reading test and 23 percent who had achieved mastery on the BSAP math test performed at less than the 8.5 grade equivalent level on the corresponding subtest of the Stanford Achievement Test. PEER concluded that the high rate at which eighth grade students fell below mastery on the BSAP test may not be attributable to excessive difficulty of the BSAP series.
4. During the 1990-91 school year, the federally sponsored National Assessment of Education Progress (NAEP) for the first time structured its sampling procedures to permit comparisons among states. NAEP used samples drawn from 34 states to test eighth-grade mathematics proficiency. On NAEP math tests administered in 1990-91, North Dakota eighth-graders performed best among the participating states and Louisiana eighth-graders had the lowest scores. The Mississippi Department of Education chose not to participate in NAEP's 1990-91 mathematics proficiency testing program. However, Mississippi participated in this program in 1991-92. Results from that administration of the test are not yet available.

# PUBLIC EDUCATION IN MISSISSIPPI 1960-1992

*Marianne Hill and Kathleen Sullivan\**

Between 1960 and 1990, the percentage of Mississippi adults with high school diplomas tripled, rising from 21.5 percent to 64.3 percent. For the nation as a whole the comparable increase was from 34.3 percent to 75.2 percent. In achieving this progress and other advances in education, the state educational system has undergone tremendous change. This article traces the progress in education in Mississippi, relying heavily on statistical markers which, while important, cannot capture the impact of qualitative changes in policies.

The numbers show impressive gains, yet a need for continued effort is clear. This article provides some background on major milestones in educational policy in the state and examines changes over time in such areas as funding. The final section highlights some of the findings.

## **The Historical Legacy: 1869-1960**

In 1869, during Reconstruction, the state of Mississippi formally recognized its obligation to provide public education to all its citizens. It was the first state to do so formally within a state constitution.<sup>1</sup> The 1869 and 1890 constitutions provided for a public school system with a four-month annual school term. The 1890 constitution, in addition, specified separate schools for whites and blacks. Mississippi enacted a compulsory attendance law in 1918, the last state to do so. At that time, some residents of Mississippi and other states saw schooling as an expensive and unnecessary burden, and new schools were sometimes burned in protest (Winter (1988)). There was great inequality in funding among districts, yet despite this inequity, supplemental funding for poorer counties was found to be unconstitutional by the State Supreme Court of the period.

At the end of World War II, expenditures per pupil were low at \$53 (\$443 in 1990 dollars), and in 1953 the legislature undertook

a thorough examination of public education, issuing a special committee report.<sup>2</sup> At that time, of the population 25 years of age and older, about one in three whites and one in 24 blacks had finished high school. A person with six hours of college credit could teach in public schools.

Based on the report, the legislature enacted the Minimum Foundation Program and provided new financing for education effective in 1954. By the 1955-56 school year, the average total expenditure per pupil had risen to \$159 (\$760 in 1990 dollars), with \$101 or 64 percent of that total going to instruction. Expenditures per pupil were lower for black schools: the average expenditure on instruction was \$123 in white schools and \$76 in black schools. This level varied greatly by county: for example, in Washington, a Delta county, expenditure per pupil on instruction in white schools averaged \$132 (or \$629 in 1990 dollars) and in black schools, \$34 (\$162 in 1990 dollars).<sup>3</sup>

In 1954, the year the Minimum Foundation Program was enacted, the Supreme Court in *Brown v. Board of Education* ruled against "separate but equal" educational facilities. In reaction Mississippi passed a constitutional amendment repealing the state's obligation to provide public schools, and in 1956 the state rescinded its compulsory attendance law. Yet the state's growing concern with education was having an impact, as seen in the increased number of students staying in school longer. There were almost three times as many children in first grade as in eighth in 1953-54, but by 1961-62 that ratio had shrunk to 1.5.<sup>4</sup>

## **The 1960s**

As of 1960, 42 percent of whites and only eight percent of blacks 25 years of age and older had completed 12 years of education, but changes were underway. Influencing Mississippi's efforts, federal funding for education in the state grew rapidly during the

1960s, rising from only 1.0 percent of total income for education in 1955-56 to 6.3 percent in 1960-61, to 17.7 percent in 1965-66, and peaking at 28.3 percent of total funds in 1970-71 (or \$561 per pupil in 1990 dollars). At the same time, pressures for integration of the schools increased. However, integration in Mississippi proceeded slowly in the 1960s; there may have been less integration at the end of the 1960s than at the turn of the century when 14 percent of blacks in the 11 states of the old Confederacy attended desegregated schools (Johnston (1990)). *Newsweek* (8/21/67) reported that only 3.2 percent of black pupils attended schools with white children in 1966.

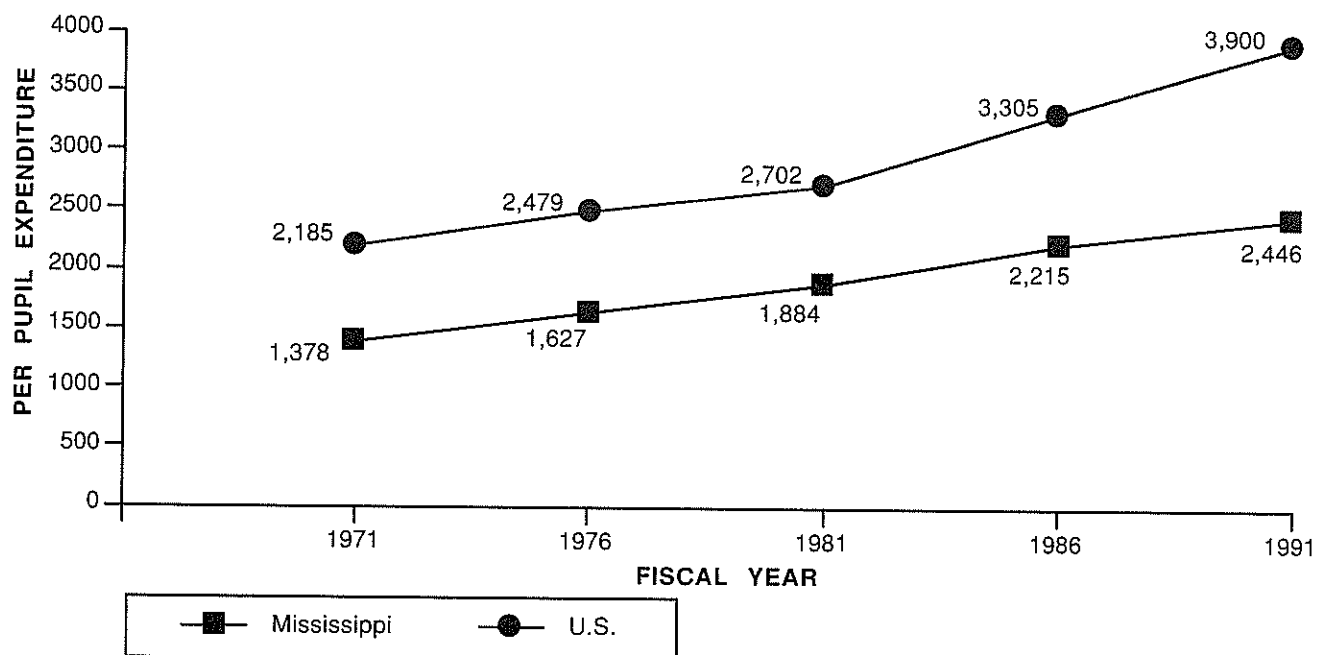
At the same time, other efforts at education

reform were proceeding. Perhaps the most significant was the attempt to institute a lay board of education to ensure independent oversight of the educational system. Despite backing by Governor Waller, this initiative failed in the legislature in 1970.

#### The 1970s

The federal courts in 1970 ordered elimination of all artificial barriers to integration and mandated widespread busing, pairing of schools, and other devices to achieve maximum integration in about 50 of the state's 148 school districts. One immediate result was a reduction of enrollment in public schools. Between fall 1968 and fall 1972, public school

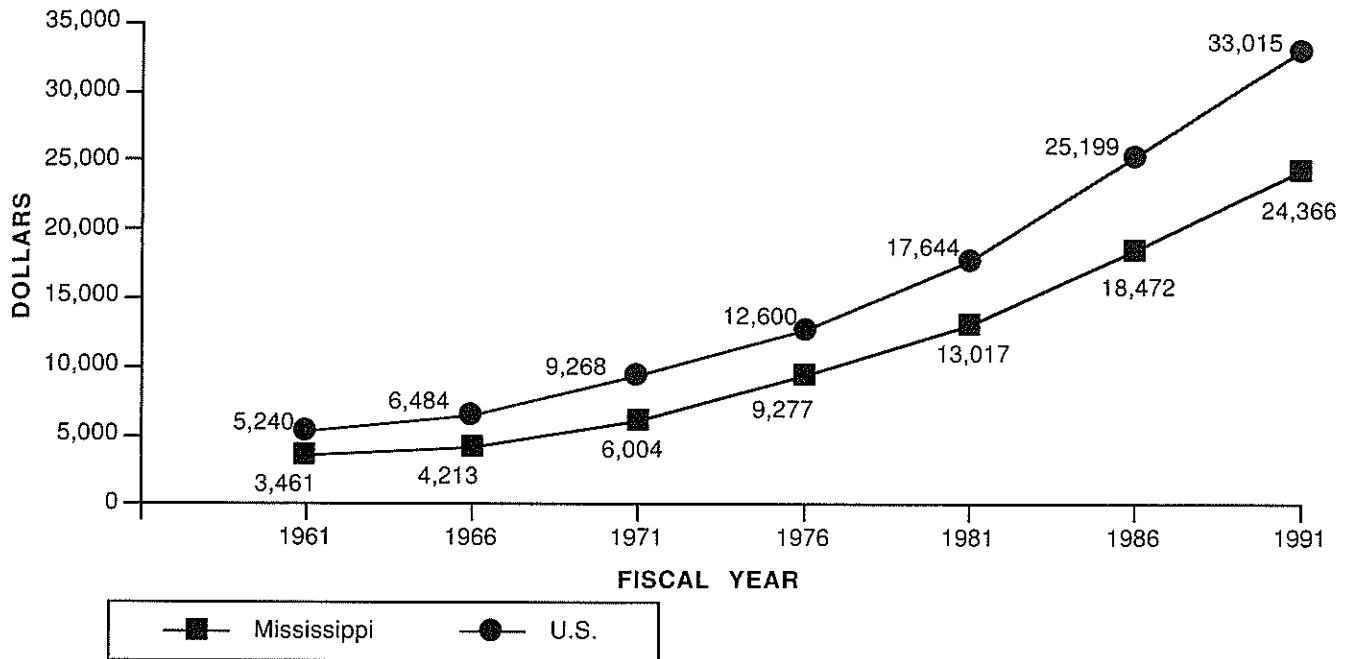
Figure 2-1.  
**TOTAL EXPENDITURE PER PUPIL IN MISSISSIPPI AND U.S. PUBLIC SCHOOLS, FY1971- FY1991**  
 (In constant 1982 dollars)



SOURCE: Reports of the State Superintendent of Public Education, 1972-92; National Center for Education Statistics; and GNP deflator from *Economic Report of the President 1992*.

Figure 2-2.

**AVERAGE ANNUAL TEACHER SALARIES, MISSISSIPPI AND THE U.S., FY 1961 TO FY1991**



SOURCE: Mississippi Association of Educators; National Center for Education Statistics, *Digest of Education Statistics*, 1991, Table 72.

enrollment dropped by 9.5 percent. Nonpublic school enrollment, which includes data from state-supported, Choctaw, and private schools, increased by 153 percent over the same period.

By fall of 1972 the racial composition of public schools in some formerly segregated districts had radically changed. In Jackson, for example, the typical high school had an enrollment that was 40 to 70 percent black (*MagnaScope* (Fall 1972)).

During the 1970s, total real funding for public school education in Mississippi grew more slowly than during the 1960s, but more quickly than in the rest of the country, fueled in part by the rapid income growth occurring in the state as manufacturing employment grew. Based on data from the State Department of Education and the National Center for Educa-

tion Statistics, Mississippi's expenditure per pupil rose from about 53 percent of the U.S. average in 1960, to 63 percent in 1971, and 70 percent in 1981, then dropped back to 63 percent in 1991. As seen in Figure 1, expenditures per pupil rose by an average 3.7 percent annually in real terms, 1971-1981, and teachers' salaries in real terms (Figure 2) grew by two percent per year. State expenditures, which accounted for 48 percent of total education expenditures in 1971, grew more rapidly than federal funding and made up 53 percent of the total in 1981.

The growth in Mississippi teachers' salaries exceeded the rate of increase for the average U.S. teacher, who actually suffered a 12 percent decline in buying power during the 1970s. As a consequence, there was a narrowing of the

gap between the average salary of a Mississippi classroom teacher and that of the average U.S. classroom teacher. In FY1971, Mississippi's teachers were paid 35 percent less than the amount earned by the average teacher in the U.S., but by FY1981 this gap had declined to 26 percent, where it remains today.

Concern about the quality of schools resurfaced as a major issue in 1973 when a nationwide test showed fifth and eighth graders in Mississippi scored only one-half of the national norm (*Times-Picayune* 10/14/73). Nonetheless, between 1974 and 1980 only 44 percent of education bond elections passed. One of the few education improvement measures that was enacted in the 1970s made school attendance compulsory again, although no provision was made for enforcement. As of 1980, 64 percent of the white population and 33 percent of the black population over 25 had finished high school, compared to 53 percent of the white population and 15 percent of the black population in 1970. In 1990 the percentages were 72 percent for whites and 47 percent for blacks.

### The 1980s

Major educational reforms were enacted in 1982, a year of extraordinary political mobilization around the issue of education under the leadership of Governor William Winter. In the spring of 1982, the legislature approved a lay board of education. This change required a constitutional amendment, and after campaigns across the state, the necessary voter approval was secured in November. The mobilization culminated in the passage of the 1982 Education Reform Bill, despite the recessionary pressures of the early 1980s, in a special session called in December 1982. (See Mullins (1992) for a full account of the history of the 1982 Education Reform Act.)

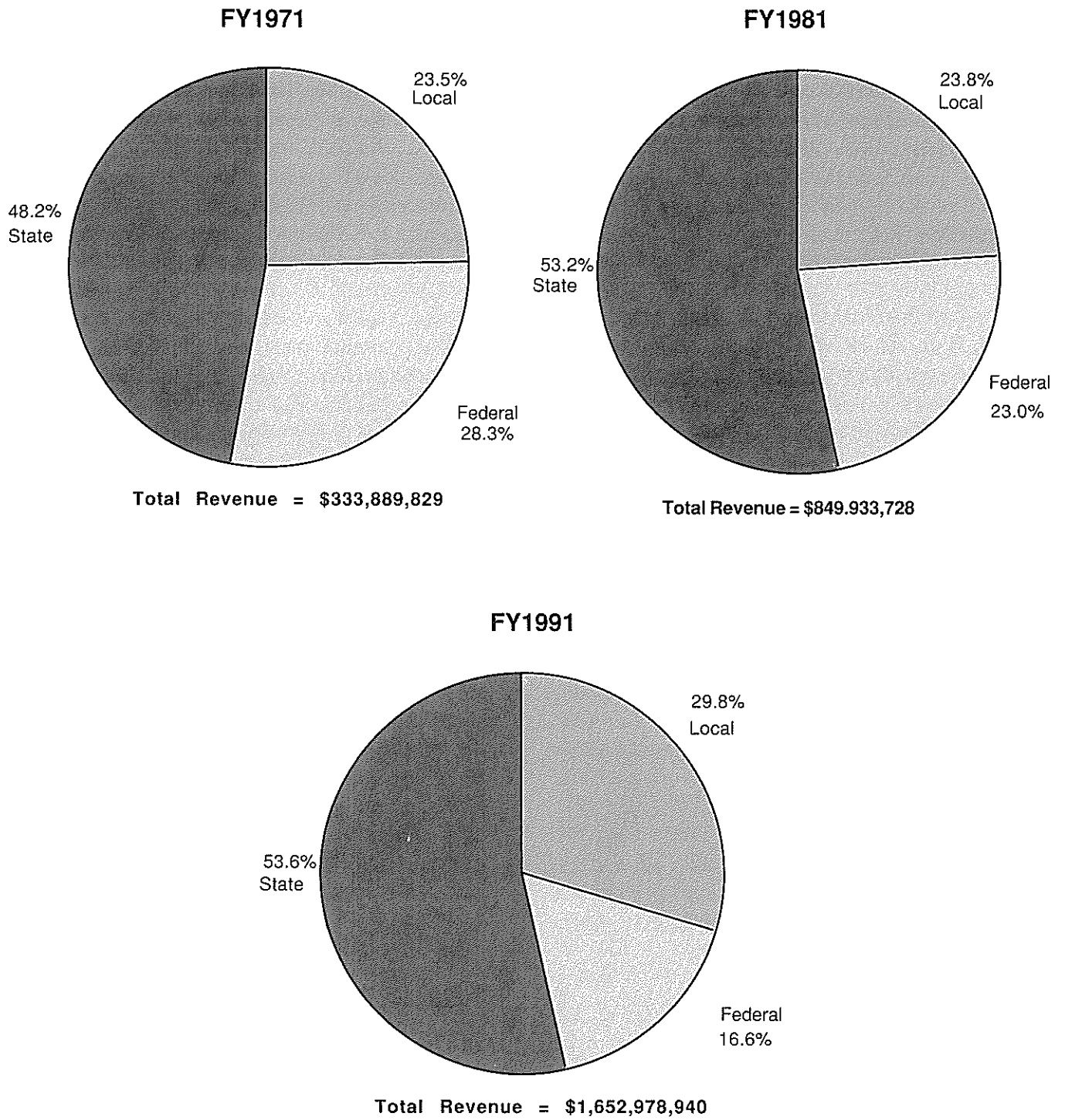
The Reform Act of 1982 put into place a statewide mechanism for measuring academic achievement, and the Board of Education set new standards for accreditation including a standardized and broadened curriculum. Procedures for teacher certification and

personnel appraisal were revamped, as were programs for teacher preparation and development. The act also called for the restructuring of Department of Education and the creation of a training program for administrators. All schools were required to offer kindergarten programs, and teacher aides were provided for the first three grades. Resources were provided for enforcing the state's compulsory attendance law. Salaries were increased (\$1,000 across the board in 1982) and new funding sources approved.

Changes continued throughout the 1980s. Vocational education in the state was expanded. In 1980 only 0.4 percent of the population was in vocational or technical training versus 9.3 percent in the nation as a whole (Mullins (1992)). By the 1991 academic year, over 20 percent of secondary students were taking vocational education classes, which currently include computer courses and other white-collar skills oriented towards today's workplace. (The exact number of students in these classes could not be determined due to problems of double-counting.) In the U.S. as a whole, 27 percent of secondary school students are enrolled in vocational/technical programs.

In 1985 the first widespread teachers' strike occurred, affecting several sections of the state. A three-year salary increase and a prohibition against teachers' strikes were passed by the legislature that year.<sup>5</sup> In 1988, the legislature enacted a large increase in educational appropriations, which brought the state's average salary for teachers up from 49th in the country to 43rd. Despite the emphasis on education, the growth in funding for education was slower in the 1980s than in the 1970s when measured in expenditure per pupil in constant dollars: in the 1970s the growth rate had been 3.7 percent, but in the 1980s it dropped to 3.0 percent. In part this was due to the end of the growth spurt experienced by the state economy in the 1970s, which had increased both incomes and business demand for skills in short supply in the state. At the same time, national expenditures per pupil were growing at the higher rate of 4.4 percent, so that Mississippi's

Figure 2-3.  
MISSISSIPPI PUBLIC SCHOOL REVENUE BY SOURCE AS A PERCENT OF TOTAL REVENUE, FY1971, FY1981 AND  
FY1991



SOURCE: Analysis of Annual Report of the State Superintendent of Public Education, 1972-1992.

expenditure per pupil dropped back from 70 percent of the U.S. average in 1981 to 63 percent of the national norm by 1990.<sup>6</sup> Local funding of education became more important in the 1980s, as Figure 3 shows: the local share of total funding rose from 23.8 percent to 29.8 percent between 1981 and 1991. Local revenue (e.g. revenue from ad valorem taxes levied on real estate and automobiles) made up 23.5 percent of all school funding in FY1971.

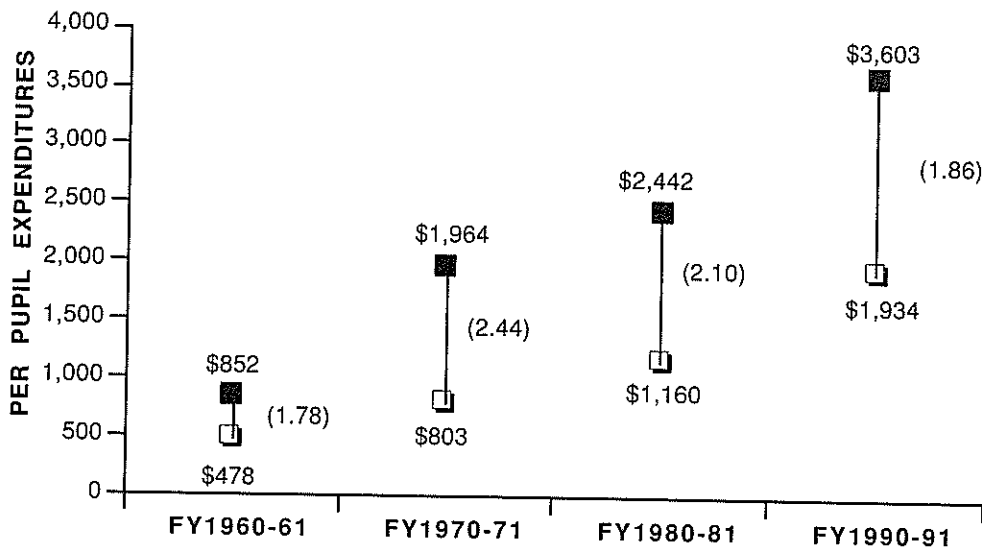
**The 1990s**

The matter of equity in per-pupil funding among local school districts emerged as a premier educational and legal issue throughout the U. S. in the 1990s (Gold (1991)). In more than a dozen states residents of school districts with relatively little taxable property filed lawsuits contesting state school-financing schemes. Plaintiffs in these school finance suits

generally contend that large disparities in per-pupil expenditures among the school districts in a state constitute violations of individual state constitutions.

In Mississippi the degree of difference between the district with the highest per pupil spending and the district spending the least per pupil increased markedly from FY1961 to FY1981, but declined over the most recent decade. (See Figure 4.) In FY1961, the district with the highest per-pupil expenditure (\$852 in constant 1982 dollars) spent 78 percent more per pupil than did the district spending the least (\$478). In FY1961 the factor by which the highest district exceeded the lowest district was 1.78. That factor (highest divided by lowest) increased over the next two decades, reaching a value of 2.10 (\$2,442 vs. \$1,160 in constant dollars) in FY1981. By FY1991, however, the funding disparity between the highest and

Figure 2-4.  
**HIGHEST AND LOWEST PER/PUPIL EXPENDITURES IN MISSISSIPPI SCHOOL DISTRICTS IN CONSTANT (1982) DOLLARS, FY1961, FY1971, FY1981 and FY1991**



- Highest per/pupil expenditure in any Mississippi District
- Lowest per/pupil expenditure in any Mississippi District
- ( ) Ratio of highest expenditure to lowest (highest/lowest)

SOURCE: Analysis of Reports of the State Superintendent of Public Education, 1972, 1982 and 1992.



lowest districts fell to 1.86, a level considerably closer to the 1.78 factor existing in FY1961. This means that currently for every dollar spent per pupil in the highest income district, only 54 cents is spent in the lowest income district.

Mississippi's recent narrowing of the gap between the highest and lowest levels of funding per pupil may be related to passage of the State Uniform Millage Assistance Grant Program (commonly known as the "equity funding" program) in 1989. That law required that school districts with low levels of local tax effort per student increase ad valorem levies in order to qualify for state Uniform Millage Assistance Grants, which amounted to approximately \$21 million statewide in FY1992. The program was intended to infuse "new" local and state funds into the coffers of school districts with the lowest levels of per-pupil spending, bringing their spending somewhat higher. The uneven distribution of wealth, and so of the tax base, among school districts means that improving the funding levels of the poorer districts will continue to be a problem.

Related to this, when districts attempt to improve the quality of education by requiring that parents pay fees for educational activities or purchase educational materials for their children, there arises the problem that hardship cases may be excluded from access to these activities and materials. While State Code 37-7-335 prohibits such exclusion, parents are often not informed of the school's hardship waiver policy, which varies from district to district. There have also been allegations that some schools have violated this code, and there are currently no provisions for enforcement. (As of 1989, 33.5 percent of children in Mississippi were living in poverty according to the U.S. Census.)

Mississippi now ranks 48th among the states in per-pupil expenditures on primary and secondary education. Although Mississippi ranks low nationally in spending per pupil, the state does well in spending effort compared to other states. For example, in 1988-89, the most recent year for which data are available,

Mississippi devoted a higher-than-average proportion of its personal income to public education (\$52 per \$1000 of personal income in Mississippi compared to \$46 nationally). In that year, only 12 states spent a larger share of state and local general funds on education.

The level of priority afforded elementary and secondary education among the program areas vying for state funds has remained relatively stable in Mississippi since the early 1970s. Increases in education spending have kept pace with (but have not exceeded) increases in overall state general fund spending between FY1971 and FY1991. In FY1991, the state spent 26.3 percent of its combined general and special fund budget on public education, which was slightly lower than the 28 percent spent in FY1981. However, the sales tax increase enacted in 1992 specifically for education will restore the funding lost during the budget cuts of 1990 and 1991.

There are reasons to expect that there will be a tendency for expenditures on education to increase more rapidly than revenues. For example, the number of children classified as disabled increased at three times the national rate from 1980-1989 (a 30 percent increase in Mississippi compared to a 10 percent increase nationally). Mississippi employed over 1,000 more special education teachers in 1991 than it did a decade earlier (a 31.8 percent increase) ((PEER (1992)). While increased expenditures on preventive health care could significantly reduce the incidence of disability in children in the state (see Appendix I), there will remain a need for special education programs. The need to provide improved education in science and other technical areas will also contribute to rising costs.

#### **Current Issues in Mississippi Education**

Many of the issues which were addressed by the 1982 Reform Act remain on the agenda of those seeking to structure education to meet the needs of the 1990s. These concerns relate to administration, the use of outcome-based criteria in the evaluation of education, teacher training and evaluation, curriculum, facilities,

## EDUCATION INITIATIVES IN THE 1990S

States throughout the nation have begun a broad range of initiatives aimed at improving their educational systems. According to Koprowicz in *State Legislatures* (1993), social and family ills, funding inequities, and top-down decision-making that blocks efforts to education reform head the list of education-related problems being tackled by states.

Studies over the past 25 years have shown that a child's social environment, including his or her family and social background, is critical to the child's educational achievement. Where a developmentally supportive social environment is missing as a result of poverty or related factors such as low levels of schooling among parents, low academic achievement is a likely outcome. Preventable health factors, such as prenatal exposure to alcohol, drugs or smoke, lead poisoning, child abuse, and malnutrition also have serious negative effects (see Appendix I). To address these problems, schools in several states have increased their efforts at interagency collaboration. In Iowa, for example, at-risk children can receive a variety of health, employment, and educational services, all at the school site, if the school is participating in a program enacted in 1989.

Top-down management that may stifle the initiatives of individual schools is being addressed by such changes as increased site-based

management, regulation waivers for schools meeting certain achievement-based criteria, and charter schools, relates Koprowicz. Chicago, for example, created Local School Councils including parents, community representatives, teachers, and the school's principal to oversee each school. South Carolina waives regulations regarding class structure and scheduling when there is a high rate of improved student achievement at a school. Minnesota has chartered schools for high school dropouts, as well as an open school with an environmental focus and a Montessori-style elementary school.

Funding and administrative reform remain contentious issues. Oklahoma in 1990 enacted one of the more sweeping efforts at change, with new education money coming from an increase in the sales, corporate, and personal income taxes; a sales tax refund will go to low-income families. Kentucky undertook a major restructuring of its education system in response to a Kentucky Supreme Court decision. There has been a reorganization of the entire department of education and the state governance system that is being implemented with a generally positive response from the education administration. Funding and administrative reform will remain major issues on the agenda of many states during the 1990s.

equity funding, and policies for dealing with the broader social issues which impact the effectiveness of educators. Some of the major issues facing the state are described below.

- A 1992 report of the Performance Evaluation and Expenditure Review (PEER) Committee assessed the performance of the State Department of Education. The need to improve accountability for the success of each major program area was a basic conclusion. Expenditures cannot be accurately tracked as currently budgeted, and the criteria set for performance assessment, whether within the system or for use by outside evaluators such as parents, makes it difficult to hold officials accountable for results, according to the report. (See Appendix II for a summary of major findings.)

- There are currently 149 school districts, some of which have as few as 338 students, yet each has its own superintendent and administrative structure usually including a board of education and administrative and program staff. There are also four agricultural high schools. By contrast, there are 82 counties in the state. While the 1982 education act contained a provision for consolidating districts, this was later rescinded. Another issue is the election of school superintendents; in cases where the school district superintendent is elected and independent of the board of education, political impasse on important policy issues often results. In this situation, the policy of electing the superintendent must be reassessed.

- Measures of student achievement require improvement. The Basic Skills Assessment Program (BSAP), which was used to measure student proficiency in reading, mathematics, and writing in grades three, five, and eight, was discontinued in the 1992-93 school year, and needs to be replaced. An alternative form of achievement testing, termed "authentic testing," is currently being considered. This form of testing aims at formulating tests that more accurately reflect the problem-solving tasks

encountered in real life. It has yet to be developed to the point where valid, cost-effective tests are available, however. Only the functional literacy test, given in eleventh grade, currently measures whether students have attained certain minimal skill levels.

- The problem of assessing student achievement is closely tied to the problem of accreditation. Until a consistent standard for measuring academic performance is put in place, it is not possible to establish an achievement-oriented accreditation system. Currently, Mississippi's accreditation system is both process- and outcome-oriented. It is process-oriented to the extent that schools are evaluated on the basis of whether and how administrators and teachers perform certain relatively well-defined tasks, e.g., are class outlines prepared by teachers, how many hours of mathematics, reading and other subjects do students receive, what are the class sizes? In addition, schools are obliged to meet certain minimum requirements with regard to books, lighting, toilet facilities, etc.

But accreditation should be strongly tied to a variety of output measures as well as inputs. Recently, the State Board added to its accreditation criteria districts' success in meeting federal standards for Chapter 1, a remedial education program. The board also considers a district's record in retaining students through high school graduation in identifying high-achieving districts but not in determining whether a district meets minimum standards of performance. The State Board of Education at one time planned to include other outcome indicators in measuring the adequacy of district performance, such as job placement rates for vocational education students. However, the board has deleted mention of these measures from recent statements of accreditation standards.

When a school fails to meet accreditation requirements, methods for remedying the areas of deficiency often prove inadequate. If the school district has a poor tax base and a budget deficit, for example, the school may be placed on probationary status. Classifying a district as

probationary, however, does not guarantee that the deficiencies will be corrected, or, if corrected, that the problem will not recur. The most frequently cited shortcoming among school districts on probationary status in 1991 was financial deficit, and the second most common problem was condition of facilities. (Some low-revenue districts consistently avoid deficits and ensuing accreditation problems; that is, recurring deficits may be due to poor fiscal management, as well as low or fluctuating revenues.)

In addition to placing districts on probation, the State Board now has the authority to take more drastic measures. In 1991 the legislature authorized the board to take over a school district with an unsatisfactory performance record. This remedy has not been used in Mississippi, though, so its potential for ensuring long-term improvements in deficient districts has not been determined.

• Inevitably, the quality of teaching is tied to the quality of teaching candidates who are recruited largely from elementary and secondary schools in the state. As a result of the education reform initiative of the 1980s, the universities in the state providing teacher training instituted a testing program aimed at raising teacher qualifications. All junior-level students must attain a minimum score, set by Mississippi, on the National Teacher Examination if they wish to continue in the teacher education program. In addition, if a certain percentage of graduates of a program cannot demonstrate competence in the Mississippi Teacher Assessment Instrument within a year of graduation, that university program will eventually lose state approval. These steps are intended to ensure continuing improvement in some aspects of teacher education.<sup>7</sup>

Currently, entry-level requirements for new full-time teachers at the elementary level include a bachelor's degree and a teaching certificate. The average teacher's salary was \$23,946 at the primary level and \$24,996 at the secondary level in FY1991. In some school

districts, the beginning level salary for a new teacher is as low as \$17,875. Health benefits are not yet provided, although legislators are likely to enact at least some benefits this spring (no decision had been made as the *Review* goes to press). In part because of the low salaries relative to educational requirements and to teaching opportunities outside the state, there are currently many unfilled openings for classroom teachers: 61 as of January 1993. The problem is expected to be more severe in the future, particularly at the secondary level. Secondary school teachers at the entry level are now required to have a bachelor's degree in their specialty discipline. When this bachelor's degree is in a technical or scientific discipline, the salaries in teaching are even less likely to be competitive. Rural areas are particularly likely to suffer from teacher shortages.<sup>8</sup>

• Social problems, including drug abuse, child abuse, violent crime, and lack of health care or other necessities impact students and teachers. While these problems cannot be adequately addressed within the school system, there is room for closer coordination between the school and social services to ensure, for example, that any major health or abuse problem affecting a child will be identified and handled. Educational programs that can act as preventive social care in these areas also hold great potential; some such programs are already in place, e.g. for drug abuse, but others have not begun. Other states, such as Minnesota, provide models for potential solutions.

### Conclusions

Among the many statistics presented in this brief survey of education in Mississippi, a few stand out. One is the surprising finding that expenditures per pupil in the state, after rising to 70 percent of the U.S. average in 1981, fell back to only 63 percent of the U.S. average in 1991, the same level these expenditures had been at in 1971. This circumstance, along with the low achievement scores of Mississippi students on national tests (see accompanying article), indicates that despite recent efforts

Mississippi has made unsatisfactory headway in closing its educational gap with the rest of the country.

Gains in the level of education, however, have been substantial. As of 1990, 64 percent of the population 25 years of age and over had completed high school, compared to 22 percent in 1950. And expenditure on public education as a percentage of personal income has been higher in Mississippi than the national average for several years.

As efforts to improve education continue in the 1990s, issues of equity funding will be receiving increased attention. Mississippi's progress in this area has been slow: in FY1961, for every dollar spent per pupil in the school with the lowest per-pupil expenditure there was \$1.78 spent in the highest expenditure district, and in FY1991 the figure for the top district was even higher, at \$1.86. Nonetheless, this change represented an improvement over FY1971 and FY1981 when the ratio of highest-to-lowest was over two to one.

While there is need to improve both per-pupil expenditures and the distribution of these expenditures, the funding constraints facing the state mean that innovative programs and the use of new technologies must play a critical role in bringing educational achievement up to or above the national level. And positive changes in education will have a multiplier effect within the state. As rising educational levels interact with the economy, income growth will accelerate, thereby increasing the level of funding available for education and in turn

further improving education. The cost-effectiveness of educational expenditures is explored in "Education and Economic Progress" in this *Review*.

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\*The authors wish to thank Andrew Mullins, Arthur Peyton, Lynn Weis, and all participants in the University of Mississippi History Symposium on Education, October 1992, as well as the many helpful members of the State Department of Education. The opinions expressed in this article, however, are solely those of the authors.

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## NOTES

1. According to Antoine (1991), while states such as Massachusetts provided free public education on a town-by-town basis, there is disagreement among historians as to whether the "Common Law" statutes, which established free public education citywide, were adopted statewide prior to Reconstruction.
2. The report in part noted the low graduation rate and the poor state of many facilities. It found, for example, that there were "very few rural schools for Negroes in Mississippi that (had) sanitary drinking water facilities or sanitary toilet facilities."
3. Based on Department of Education figures, deflated using the GNP deflator of the U.S. Department of Commerce.
4. Most of the dropouts occurred between first and second grade. For example, in the 1954 academic year there were 106,839 persons enrolled in first grade but only 59,189 in the second. Repetition of the first grade would also raise entry-level enrollment and account for some of the gap. This gap between first and second grade enrollments continued for several years but had dropped to about 17,000 in 1958, and by 1969-70 second grade enrollment was less than 2,000 lower than the first grade's.

5. Major issues during the strike were salaries, condition of facilities, and instructional materials. The anti-strike legislation included provisions for fines and jail sentences both for teachers who strike and for school board members who negotiate with them.
6. A national study shows that a large portion of the U.S. spending increase in recent years is attributable to rising special education costs (Carson, Huelkamp and Woodall (1991)). States whose teachers historically have earned more competitive salaries also may be devoting a larger share of their increases in per-pupil spending to such efforts as in increasing purchases of materials and equipment (e.g. computers), decreasing class size, offering a broader selection of high school courses, etc.
7. In FY1992, the mean score on the three basic required sections of the NTE (the core battery), apart from specialty fields, was below passing at Alcorn, Jackson State, and Mississippi Valley, and above passing at the other state universities. The disparity in student scores among these universities raises issues related to the Ayers case, in which the Supreme Court has ruled that there remain unconstitutional remnants of Mississippi's prior dual system of higher learning.
8. A promising new development is that long-distance learning via satellite is currently available in 162 Mississippi schools. Also, students in four school districts in FY1991 inaugurated the first interactive television instruction, another method of instruction holding potential particularly for the rural areas.

## Appendix I

### Preventable Early Childhood Risk Factors

Since the release of the Coleman report, researchers have studied in detail many of the societal factors affecting achievement. Poverty, ethnicity, and household composition have been shown to affect academic achievement (Education Commission of the States (1988)). The Education Commission of the States (ECS) recently synthesized findings of a wide range of major research studies on development of learning impairment in children from birth to age five (Newman and Buka (1990)). ECS researchers found that the major preventable risk factors are: (1) low birth weight; (2) smoking; (3) lead poisoning; (4) malnutrition; (5) prenatal alcohol exposure; (6) prenatal exposure to drugs; and (7) child abuse and neglect.

(1) Low birth weight. Researchers cited by ECS found that children weighing less than 5.5 pounds are at increased risk of school-related problems, such as grade repetition and assignment to special education classes. Children weighing less than 3.25 pounds at birth are at particularly high risk for visual and auditory impairment and learning disorders, and are more likely to be inattentive, hyperactive, depressed, socially withdrawn, or aggressive. With more than one-third of its children living in poverty (the highest child poverty rate in the nation) and proportionally more births to single teens than in any other state (15.8 percent of all Mississippi births), Mississippi has the highest incidence of low

birth weight in the U.S. (9.4 percent of all births compared to a U.S. average of 6.9 percent). Almost one-fourth of Mississippi's 4,171 low-birth-weight babies born in 1990 weighed less than 3.25 pounds.

(2) Smoking. ECS researchers also cited smoking as a preventable factor affecting children's ability to learn. The effects of smoking are difficult to distinguish from the effects of poverty, but one study cited by ECS showed that middle-class children whose mothers smoked heavily during pregnancy scored lower on verbal tests than children of lighter smokers, who in turn scored lower than children born to nonsmokers. Other studies have demonstrated that the impact of heavy smoking increases when it occurs earlier in pregnancy. These and other studies reviewed by ECS researchers have contributed to a consistent pattern of association between smoking and learning impairment.

(3) Lead poisoning. Poisoning from lead, a ubiquitous toxin that can be absorbed into the body through eating and breathing, is another preventable condition that affects children's learning (Graef (1992)). Even low levels of lead can lead to lower intelligence, deficits in speech and hearing, attention and behavior disorders, increased distractibility, lack of persistence and organization, and inability to follow directions (Newman and Buka (1990)). Approximately 10 to 15 percent of all U.S. preschool children have dangerously

elevated levels of lead (Environmental Defense Fund (1992)). Little current information on incidence of lead poisoning in Mississippi is available. Results of a 1986 pilot study (Griffin (1986)) are based on a relatively high threshold believed at the time to represent the danger level. That study, which tested young children from 18 counties, showed an incidence of lead poisoning of less than one percent. However, at that time more than twice as much lead in a child's bloodstream was considered safe than the level now recognized as acceptable under current federal guidelines. Black children participating in the 1986 Mississippi study were more than six times as likely as white children to have blood lead levels exceeding the danger threshold.

(4) Malnutrition. Prenatal and early childhood malnutrition, another factor affecting achievement, affects three percent to 10 percent of U.S. babies (Newman and Buka (1990)). Fetal malnutrition associated with several of the other risk factors previously listed, such as drugs, smoking, and alcohol use, can be caused by constricted blood vessels in the placenta, as well as by limited dietary intake. ECS researchers found that the combination of nutritional supplements, such as that of the federal Women, Infants, and Children (WIC) program, and environmental enrichment, such as that provided in educational programs,

counteracts some effects of malnutrition. However, brain damage caused by inadequate nourishment during the 12th to 24th weeks of gestation is not reversible (Newman and Buka (1990)).

Many of the early childhood risk factors listed in the ECS report are closely associated with poverty and with the percentage of babies born to poor, single, teenage mothers (Newman and Buka (1990)). Mississippi's rate of births to single teens, the highest in the nation, increased from 13.6 percent to 15.8 percent of all births from 1980 to 1989 (Annie E. Casey Foundation (1992)). Childhood poverty increased from 30 percent to 34 percent during the 1980s.

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**Appendix II**  
**Major Findings of PEER Review of State Department of Education**

•The State Board of Education is moving toward "deregulation" of districts and reductions in testing, even though 10 percent of students tested cannot master reading, math, and writing and 37 percent fall below minimum performance levels in at least one of these subjects.

•Low accreditation standards, excessive technical jargon, and the use of district averages make it difficult for parents to hold school officials accountable.

•Only 14 of the department's 754 employees work in the division that provides curriculum support to regular classroom teachers; 525 work in other programs and 215 work at the schools for the deaf and blind.

•The Associate Superintendent of Vocational-Technical Education has not been accountable

to either the board or State Superintendent of Education since 1986.

•Vocational-technical education received \$10 million more in general funds in FY1989 through FY1991 than needed to maintain federal funding, including a \$1.8 million deficit appropriation in FY1991.

•The Minimum Program law requires excessive paperwork, is less precise than systems used in 42 other states, and permits certain special education and vocational-technical students.

•The board's five-year plan is not comprehensive, lacks measurable outcomes, and has not been used effectively to guide departmental budgeting and services to school districts. The department does not have effective internal audit and program evaluation systems.

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NOTE: Changes may have taken place in response to the PEER report since its publication in 1992; these changes are not reflected here.

SOURCE: Excerpt from Legislative PEER Committee, *A Review of the State Department of Education's Internal Management and Its Oversight of District and Student Performance*, Jackson, MS: 1992, p.i.



# EDUCATION AND ECONOMIC PROGRESS

*Marianne Hill*

Market expansion and job creation, which are basic to future economic growth in Mississippi, depend on the knowledge and know-how of the state's residents. Education plays a vital role in developing that knowledge and know-how. An analysis of public investment in education from an economic perspective, however, highlights some important points. In particular, improved educational levels alone will not result in new, higher income jobs. Rather these jobs depend on the creative activity associated with new products, technologies, and methods of management. The need for a greater emphasis on creativity, innovative thinking, and scientific and technical education in the state is a conclusion of this article.

## **Assessing the Return to Investment in Public Education**

Statistical studies of education have found the rate of return to investment in education to be very high, whether considered from the viewpoint of the individual or that of society.<sup>1</sup>

One study estimates the rate of return to investment in a college education by a high school graduate to be 19 percent for the individual, based on comparing the cost of education (including foregone earnings as a cost) to the increased income that the individual can expect (Musgrave and Musgrave (1989)). For primary and secondary school, the return is somewhat higher, due to lower expenses. If the individual had to bear the cost that is now assumed by society, the return would drop to 14 percent, which is termed the social rate of return.

Table 3-1 shows the increase in income that can be expected by men and women as their educational attainment advances. The increase in earnings is lower for women than for men, as shown, and according to other studies is also lower for blacks than for whites, with black men 25 to 34 years old earning 79 percent as much as white men of that age in 1980.<sup>2</sup> In addition, the rate of return will vary according to the particular

degree obtained and the quality of education received. A study by Horton (1984) shows that the rate of return to education in Mississippi is similar to that in the rest of the country.<sup>3</sup>

Such studies do not take into account social benefits which result as aggregate educational levels rise, such as improvements in the functioning of the government, the marketplace, the community, and the home, since these benefits are not captured fully by numbers on rising incomes and tax revenues. For example, an increase in educational levels can have a positive impact in reducing crime, improving health care practices at home, and decreasing dependence on social services, thus reducing the cost of government programs. The true social rate of return will then be higher than the 14 percent cited, but the exact rate is difficult to quantify.<sup>4</sup>

A study by Williams, Lee, and Warner (1990) went beyond a study of the return to the individual and examined the overall effect of education on Mississippi's gross state product (GSP). The study found that increasing the state's educational level relative to the national average would increase Mississippi's per capita GSP by 15.8 percent, and that the consequent effects on infrastructure, industry mix, and so on would lead to another increase in per capita output of about 17.0 percent. This gain would bring the state's ranking in output per capita to 24th, and would generate an additional \$1 billion in state government revenues.

## **Education and Job Creation**

Despite the link between education and income, education itself does not automatically result in the creation of higher-income jobs. For an individual, a higher level of education will generally offer the opportunity to obtain a higher-skill and higher-paying job; or perhaps the individual's productivity in his or her current position will increase and result in higher wages. However, in general the creation of new jobs is

Table 3-1

**MEDIAN INCOME OF YEAR-ROUND FULL-TIME WORKERS, BY EDUCATIONAL ATTAINMENT AND SEX, 1981  
(PERSONS 25 YEARS OF AGE AND OVER)**

Years of School Completed	Median Income		Marginal dollar value of educational attainment	
	Women (1)	Men (2)	Women (3)	Men (4)
Elementary school				
Less than 8 years	\$ 8,419	\$12,866	--	--
8 years	9,723	16,084	\$1,304	\$3,218
High school				
1 to 3 years	10,043	16,938	320	854
4 years	12,332	20,598	2,289	3,660
College				
1 to 3 years	14,343	22,565	2,011	1,967
4 years	16,322	26,394	1,979	3,829
5 years or more	20,148	30,434	3,826	4,040

NOTE: Columns 3 and 4 = absolute (median) dollar differences between successive years of school completed.

SOURCE: U. S. Department of Commerce, Bureau of the Census Unpublished data, 1983.

essential to raising incomes, a process that is usually initiated by business.

Where education attempts to anticipate the economy's needs, there may be an imbalance between education provided and job availability. One perspective argues that improving levels of education will not necessarily result in job creation or higher income levels. This line of thought claims that it is the economy which creates jobs, and that the educational system functions largely as a tracking system for employment. According to this theory's proponents, knowledge acquired through school has little to do with the training needed for success on the job. Rather, educational attainment acts largely as a proxy for other variables, such as social status, which are the underlying determinants of labor market success. The implication is that job creation will not occur simply by improving work force skills. Along the same lines is the argument that low wages,

since they are due to an excess supply of workers competing for available jobs, will not be greatly affected by rising levels of education.

In fact, while improved levels of education and training are likely to lead to the creation of new jobs and higher incomes for all, the process is not straightforward, and there may be difficult transition periods. Improved education and skills which impart a high level of technical competence and adaptability enable greater innovation of new products, technologies, and management techniques, and their more rapid adoption. These improvements, which can range from relatively small ones to major industry shifts, result in the creation and expansion of markets, to which jobs and incomes are inevitably tied. Education plays a vital role in the process of preparing both entrepreneurs and workers with the knowledge necessary for these changes.

### **Job Shortages Predicted**

Currently, several experts expect problems with job creation during the coming decade. Data found in the *Workforce 2000* report prepared for the Department of Labor documents an expected shortage of higher-wage jobs by the year 2000, according to the analysis of this data done by Mishel and Teixeira (1991). According to this study, the net result of industry and occupational employments shifts during the 1990s will be a reduction in the average pay level, adjusted for inflation.

The commission on the Skills of the American Workforce, chaired by Ira Magaziner, published a report in 1990 which also expressed concern about the job opportunities expected to be available, particularly for the 70 percent of young people who will not graduate from four-year colleges (see *Business Week*, 6/25/90). The commission expects these youth to be facing largely low-paying nonmanufacturing jobs, due both to a lack of job creation by business and to a lack of training opportunities for non-college youth. The solution to this problem, according to the articles examining the question, lies in rapid upgrading of business practices, technologies, and worker skills--a process that has begun during the recent recession and is continuing today.<sup>5</sup> The Clinton administration has been greatly influenced in its perspective on employment creation by the commission, and is expected to stress the need for more worker training and upgrading of business practices in its policies.

### **Job Creation in International Perspective**

A comparison of the U.S. with other countries shows the problem. The commission studied 2,800 companies in the U.S. and six other countries--Denmark, Germany, Ireland, Japan, Singapore and Sweden--and found that most companies in the U.S. in 1990 accepted the idea that they had to live with a low-skilled work force, (only five percent said they were following the high-skill, high-wage option), whereas most companies in every other country said that they were pursuing the high-wage, high-skill option. A high percentage of foreign companies was achieving large productivity gains by adopting

high performance work systems, often reorganizing work to eliminate tiers of managers (as is now being done here) and were utilizing higher worker skills that enable, for example, frequent switches in production runs. U.S. businesses, on the other hand, in order to remain cost-competitive, had been downgrading skills and cutting real wages.

The problem is reflected in education. The U.S. is spending less on preschool through twelfth grade relative to GDP than other countries are. Other countries also place more emphasis on technical training, often having professional technical training systems in place for their work force. For example, in France, public preschools serve 85 percent of three-year-olds and 100 percent of five-year-olds. There are state-funded supplemental classes for schools in impoverished districts. In Germany, corporations provide extensive funding of vocational apprenticeships for 70 percent of students (*Business Week* 9/14/92). By contrast, according to Ray Marshall of the Southern Regional Council, "We do almost nothing for that 75 percent of our work force that does not go to college."

### **Mississippi's Lower Skill Workers**

Mississippi currently has many relatively low wage jobs. One concern frequently expressed about improving education is that with overly educated workers, unskilled jobs will be lost which will result in a job shortage, and state funds will in effect be wasted as workers leave the state. Is there potential for a loss of low-wage jobs in the state due to the overeducation of workers for jobs available? In brief, the loss of jobs has little to do with "overeducation." Certainly in the case of manufacturing, industries are continually moving abroad in search of lower labor and production costs whenever higher profits would result. This trend is particularly true for older industries whose technologies have become standardized so that lower skill labor abroad can be used.

At the same time, the work forces in several low-wage countries are becoming increasingly

educated, adding to competition in the global market. As a result, low-skill industries are unlikely to remain in the U.S. unless location here has other major cost advantages, e.g. due to the high cost of transporting the product from abroad or the scarcity of needed inputs in other countries. To the extent that education contributes to a general wage level in the state above that abroad, there may be some link between low-wage job loss and education, but most manufacturing plans regarding location abroad will be little affected by wage increases such as those of the last decade, which have failed to keep up with inflation.<sup>6</sup>

#### **Number of Manufacturing Jobs Shrinking**

Overall, however, manufacturing jobs, skilled or unskilled, will be relatively scarce in the future, as the share of manufacturing in total employment continues to fall from its current 16 percent national share and 24 percent local share. Already most U.S. manufacturing jobs are in industries where research and development expenditures are critical to survival, and where substantial opportunities exist to substitute higher-skill workers and improved technology for low-skill labor. The outlook in manufacturing is then for falling real wages in the shrinking number of low-wage manufacturing jobs, while the higher-wage manufacturing jobs increase only slowly.

Job creation then will depend critically on developments in the sectors of the economy besides manufacturing: construction; mining; and most importantly, services, including transportation and utilities, wholesale and retail trade, finance, insurance and real estate, health care, business services, education, and government. In the service sector where jobs are expanding, the typical job created in the 1980s provided an annual income of less than \$8,000, due to a combination of both lower wages and shorter hours than in other sectors.<sup>7</sup> The outlook for the 1990s is that about one-quarter of all new jobs added to the economy will be in the relatively low-skill service occupations, such as cooks, waitresses, janitors, and security guards. Only about 11 percent of new jobs, according to

*Workforce 2000*, are expected to be in the five most highly skilled occupational groups within the professional and technical category, which includes law, medicine, natural and social science, engineering, and architecture. The remaining occupational categories, in addition to professional and technical and four categories of service workers already listed, include managers and administrators, sales workers, clerical workers, farmworkers, craft and kindred, operatives, and nonfarm laborers. An upgrading of business practices and worker skills in all these sectors is essential to creation of middle-income jobs.

#### **U.S. Research Efforts and Job Creation**

Most of the rise in income levels, and so most growth of the U.S. market this century, has been due to technological change, that is, changes in products and in how products are produced. While technological change comes from many sources, today the final design of new products and processes originates largely from business research and development activities. Although in Mississippi as elsewhere technological progress has been the key to rising income levels and expanding markets, Mississippi has lagged the rest of the country in several measures of research activity. In 1988, Mississippi received 36 patents per million residents, a lower number than any other state except Alaska, which received 35. The national average was 179. Mississippi also has a low number of scientists and engineers employed as a percentage of the population: 86 per 10,000 in 1986, the lowest in the nation, compared to the national average of 192.<sup>8</sup>

Mississippi's ability to survive and thrive in the global markets of today depends on its recognition of the importance of technical and innovative skills. The rate of return to innovation and adoption of new technologies is arguably the highest in dollar terms of any business investment. Professor Lichtenberg of Columbia University in a study of 53 countries from 1960 to 1985, for example, found that the rate of return on R&D is seven times as high as the return on expenditures for plant and

equipment, where the rate of return is measured in terms of productivity and per capita income levels (*Business Week*, 11/16/92).

However, serious problems have been developing with U.S. research efforts, which are linked to problems in U.S. education. The National Science Board (1992), in an urgent report on the state of research, found that while in the past U.S. industry has been in the forefront of industrial research, "U.S. industry has already lost its leadership in several technologies that are critical to industrial performance, and is weak in others. The U.S. time horizon has become too short, and the Nation's business decisions tend not to be based on strategic technological considerations." While the average annual increase in U.S. R&D expenditures was 6.9 percent over the 1980-85 period, from 1985-91 it dropped to 1.2 percent and the U.S. now trails Japan and (West) Germany in nondefense R&D spending as a percent of GDP.

#### **Science and Education in Mississippi**

While the need for improved technology in Mississippi has been recognized, as reflected in various programs aimed largely at industry, science programs in the primary and secondary schools also need to be strengthened. For several years there has been no one in the State Department of Education to serve as science curriculum consultant, although these positions exist for other areas. The shortage of teachers in science is acute: almost 20 percent of science teachers in grades 7-12 were not certified in science in 1991/92 compared to a non-certification rate of five percent in mathematics for the same grade levels. Many high schools lack adequate science laboratories.

Nor can vocational training programs substitute for a solid foundation in science and mathematics. They are generally not sufficient to provide workers with an understanding of the new technologies and products that companies will be continually introducing in a world of global competition. If a worker lacks the basic training in chemistry and engineering, for example, required to understand the nature of innovations being introduced at the workplace,

his or her flexibility and skill will be less, and the company will lag global competitors who benefit from workers who can understand and adapt to change more rapidly.

In services as well, the role of technology is of increasing importance, particularly where a relatively well-defined product is involved, as in data processing. For services addressing management or social problems, the importance of technology declines while the role of creative thinking and the ability to design and assess alternative approaches assumes greater weight. For any business to expand and succeed, however, the bottom line is that the business must perform well and offer something that its competitors do not--critical thinking, creativity, and discipline all come into play.

#### **Concluding Remarks**

The economic rate of return to investment in education is highest when viewed from the perspective of its impact on the long-term growth rate, and particularly from the perspective of its role in fostering the development and adoption of new technologies, products, and methods of management. This innovative market activity is basic to job creation: improved educational levels alone will not result in new and higher-income jobs. Particularly in light of the discouraging projections of labor market trends over the decade, with real wages likely to continue stagnating for most wage workers, there is an urgent need to stress the skills that lead to middle- and higher-income job creation. These jobs will come from innovative uses of the computer, technical information, and new technologies and products, for example, and from other creativity activity. However, Mississippi's ability to benefit from such opportunities is currently severely restricted by the skill levels of its workers, which continue to be low in comparison with the rest of the country. Mississippi's educational system, in addition to its strong commitment to providing basic literacy skills, would benefit from a new emphasis on its responsibility to foster high-skill innovative activities in the work force of tomorrow.

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## NOTES

1. Statistical studies estimating this rate of return generally use data on labor market characteristics, such as the number of years of education, and relate these characteristics to income levels. Scores on standardized tests may be used as a measure of the quality of education received, which is also found to have an impact on income.  
These studies do not attempt to measure such intangibles as the heightened understanding and appreciation of life and its complexities that an education is thought to impart. In fact the mission of public education includes creating an informed and responsible citizenry with skills sufficient for success in the whole range of society's endeavors.
2. In the South, a college-educated black man, age 25-34, earns 84 percent as much as a college-educated white man, while in other regions earnings are 91 percent as much. For ages 45-54, the percentages are lower. Much of the difference in earnings can be linked to differences in jobs and in the quality of education, according to O'Neill (1990).
3. White Mississippians can expect a return to education similar to that in the rest of the country, according to Horton (1984). The rate of return for blacks was apparently lower, but this may have changed for education received since 1980; nationally, education received since that time, by black males at least, has had a greater rate of return.
4. The return to social investments in such areas as preventive health care, bridges or the environment is often comparable, which increases the difficulty of budgetary decisions. In addition, new as yet untried programs may have returns that can only be roughly estimated.
5. Programs such as those in place in the European Community provide incentives for business to choose high-wage technology options and "best practices." Several states such as Minnesota are now encouraging firms to seek out and learn from best-practice firms in their field, for example by encouraging them to enter such competitions as the Malcolm Baldrige Award competition, in which benchmark comparisons are critical.
6. The state will tend to lose jobs where higher-skill labor and machinery can substitute for lower-skill labor (e.g. automated tellers will continue to substitute for some bank tellers, more catfish will be filleted by machine), or where cheaper labor abroad is attractive, e.g. apparel. Industries in North Carolina, Tennessee, and elsewhere requiring more skilled labor, on the other hand, will be attracted to the state as skill levels here match those of their current work force.
7. Kolko, p. 311.
8. *States in Profile*, 1990.