

Choices in Education

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The American educational system consumed over 7.5 percent of our gross domestic product in 1992. In that year, over 47 million students were enrolled in elementary and secondary schools and over 14 million students in institutions of higher education. By far, the vast majority of students at all levels attend public institutions, and educational expenditures represented almost 35 percent of all expenditures of state and local governments in the early 1990s (National Center for Education Statistics [NCES] 1992, Tables 1, 31, 35).

Increasingly, this large sector of our economy has come under intense scrutiny. For example, at the elementary and secondary levels, critics point to declining test scores and continued high dropout rates—the latter being of special concern for low-income and minority students—even though real per student expenditures on elementary and secondary education increased by 58 percent over the 1970–71 to 1991–92 period (NCES 1992, Tables 3, 31, 38).

To take another example: Increasing foreign competition and the growing earnings differentials between college-educated and lesser-educated workers suggest both the importance of a highly skilled, educated workforce for our economy and the increased incentives for individuals

The four chapters in this volume were originally presented at the Contemporary Policy Issues in Education conference, which was held at Cornell University on May 21, 1993 and was jointly sponsored by the ILR-Cornell Institute for Labor Market Policies and the Princeton University Industrial Relations Section. The conference was organized by Orley Ashenfelter of Princeton and myself. It was attended by approximately fifty individuals spanning academia, private foundations, nonprofit research organizations, and public school systems. The authors of the papers benefitted from both the general discussion at the conference and the detailed comments of the assigned discussants. The latter included Orley Ashenfelter, Alan Krueger, and David Card of Princeton; Richard Murnane and Ronald Ferguson of Harvard; John Abowd and Maria Hanratty of Cornell; and William Spriggs of the Economic Policy Institute.

to obtain higher education. Yet these incentives are present at a time when many people are concerned that the higher education sector is not performing efficiently and that tuition levels at private institutions are soaring out of sight. Tuition levels at public institutions have also grown rapidly, partly because of diminished levels of state support.

Society has high expectations for our educational system, and social science research should contribute to helping meet these expectations. Research on the choices that participants in the system make, and on the consequences of these choices, is particularly useful and often provides information that is directly relevant to the policy debate. Thus the four chapters in this volume all address the choices, and the consequences of choices, made by students, teachers, and school administrators. They are grouped together in this book in the belief that providing them this way will increase their influence on public policy.

The first two chapters deal with the characteristics of teachers in American public elementary and secondary schools. Of concern to policy-makers are three primary questions: how to assure a flow of people into the teaching profession in the face of large numbers of expected retirements in the decade ahead; how to assure an adequate flow of math and science teachers particularly; and how to maintain or increase teachers' quality.

Eric Hanushek and Richard Pace's paper first compares the academic test scores of people entering teaching with the test scores of all high school graduates. Their research is motivated by studies that show that high school seniors who plan to become teachers disproportionately score in the lower half of the test distribution of all high school students who plan to enter college. This finding, coupled with a set of previous studies that show that teachers' test scores appear to be positively associated with the amount that their students learn, would seem to argue for some action to increase teacher quality, as measured by test scores.

Hanushek and Pace's important observation is that the people who actually enter teaching are not the same people who initially express interest in becoming teachers. Many who express interest never complete teacher education programs or find employment in education. Using longitudinal data from the High School and Beyond survey—a national sample of high school seniors in 1980 who were followed through the spring of 1986—they find that those initially interested in teaching who drop out along the way or fail to find employment as teachers tend to be lower-ability students (although the authors point out some important differences across gender, race, and ethnic groups). Moreover, many people who enter teaching upon graduation from college are not

among the set of people who initially plan to be teachers, and members of this former group tend to be higher-ability students than the people who initially express interest in teaching.

As a result, they find that, on average, people who are employed as teachers within six years of graduating high school tend to have substantially higher test scores than those who express interest in teaching as a career while in high school. Hanushek and Pace caution, however, as did Orley Ashenfelter in his conference comments, that, on average, new teachers' test scores are lower than those of typical college graduates. So although the test scores of people entering teaching are not as low as some might think, they also are not as high as others might have hoped.

The second part of the Hanushek and Pace paper addresses policies aimed at increasing the flow of college graduates into teaching careers. Specifically, they ask if state-level education course requirements for teacher certification, state-level test requirements for teacher certification, and the level of teachers' salaries relative to other college graduates' salaries in a state influence the probability that college graduates receive a degree in education.

They find that higher course work requirements or the presence of a certification examination reduces the probability that college graduates receive an education degree. Hence, careful consideration should be given to the usefulness of these tools in the process of attracting and selecting teachers. Contrary to the authors' expectations, teachers' relative salaries do not appear to influence the probability that students major in education. As Richard Murnane stressed at the conference, the use of statewide teacher salary data may not tell us much about the economic prospects that students face. What may be needed is more disaggregated data on relative earnings and job vacancies in smaller areas of each state.

Hanushek and Pace are careful to note, as did Murnane in his conference comments, that their analyses focus on only a fraction of the supply of teachers. They do not analyze delayed entry into the profession (people first entering more than six years after high school graduation), reentry of experienced teachers who had previously left teaching, or the determinants of exit from the profession. Previous research by Murnane and others suggests that teachers' salary levels are an important determinant of how long they stay in the profession.

David Monk and Jennifer King's paper focuses on high school mathematics and science teachers and their subject-matter competencies. More specifically, they are concerned with whether the number of courses that teachers completed in college in their subject-matter area influences how

much their students learn. Previous research has suggested that the answer is yes, and this in turn suggests that subject-matter competency is one of the factors that should be important to school districts in framing hiring and compensation policies.

Monk and King ambitiously trace four possible routes via which teacher subject-matter competencies might be linked to teacher effectiveness. First, what a student's current teacher knows obviously may influence what the student learns in the class. Second, what the student's teacher in the previous academic year knew may influence not only the student's starting point for the current year, but also his or her attitude toward the subject and thus the amount that he or she learns in the current year. Third, what the student's teachers in still earlier years knew may similarly influence the student's learning trajectory in the current year. Finally, the competencies of all the teachers in the subject area in the school may influence student learning if these teachers share ideas or teaching materials, or if the less knowledgeable teachers can go to the more knowledgeable ones for advice.

Monk and King attempt to test which of these routes actually are important, using longitudinal data from a nationally representative sample of almost 3,000 high school students who were enrolled in the tenth grade in the fall of 1987. These data, which come from the Longitudinal Study of American Youth, contain information on the experience and subject-matter knowledge (courses taken) of each mathematics and science teacher in the school, on who each student's teachers were in each high school grade, and on each student's test scores in the two subjects in each grade. The data permit Monk and King to test whether the growth rates of a student's test scores over time are related to the subject-matter competencies of the student's current teacher in the subject, of the prior year teacher in the subject, of other prior teachers in the subject, or of all teachers in the school who teach the subject.

As Alan Krueger noted at the conference, the large proportion of variance in student test scores lying within, rather than across, the schools in these data makes it difficult to assess the importance of average school-level teacher characteristics on pupil performance. Even so, it would be premature to conclude that school-level faculty variability has little explanatory power.

The data are better suited for revealing the effects of prior teachers on students, and here there emerges some evidence of impact. The results are strongest when the prior teachers are looked at collectively; this implies that the cumulative effects of a sequence of high-quality teachers are noteworthy and warrant further study. However, the estimated

impacts are never large in an absolute sense and tend to be inconsistent across different specifications of the underlying model.

The authors recognize that the number of courses teachers have taken in particular subject matters is not necessarily a good measure of the teachers' competencies in those subjects. What teachers actually know depends undoubtedly upon how well they performed in their course work, the difficulty of their courses, the quality of the instruction they received, and their own aptitude for mathematics and science. Unfortunately, Monk and King's data set contains none of these variables. Hence, the most one can prudently conclude from their paper is that there is reason to believe that teaching resources can influence pupil performance at multiple levels and that estimation of the relative magnitudes of the effects must await the collection of more refined measures of teachers' capabilities and inclinations.

The empirical results reported by Monk and King do not support strong policy initiatives such as placing much weight on the number of courses taken when hiring mathematics and science teachers or providing these teachers with salary increments for additional subject-matter courses taken. Rather, the study raises policymakers' sensitivities to the multiple means by which teaching resources can influence pupil performance.

The final two papers in the volume deal with the choices and the consequences of the decisions made by students approaching higher education. Despite the fact that nearly one-half of all first-time, first-year students attend a two-year or community college, few studies have examined how changes in tuition levels and college proximity influence students' decisions to attend two-year, as opposed to four-year, institutions. Community colleges have traditionally striven for equality of opportunity by charging low, or no, tuition. However, as noted above, the fiscal pressures faced by many states and localities in the early 1990s forced many community colleges to raise their tuition rates, sometimes faster than their four-year counterparts did.

Cecilia Rouse's paper is concerned with the implications of these policies. Did the traditionally low tuition levels and geographical convenience of community colleges attract students who otherwise would have attended four-year colleges? Or did community colleges instead provide educational opportunities for students who otherwise would not have attended any college? While the importance of this issue depends upon the extent to which the economic returns to education differ across institutional types and upon how a student's ultimate education level is influenced by the institution type in which he or she starts—issues that

Rouse herself has addressed in earlier work (Rouse 1993; Kane and Rouse 1993)—the questions she poses here are in need of answers.

Rouse uses data from two national surveys, the National Longitudinal Survey, Youth Cohort and High School and Beyond, to estimate multinomial logit models of the decisions of high school seniors to enroll in a two-year college, to enroll in a four-year college, or to not enroll in college at all in their first year after high school graduation. She finds that students who attend two-year colleges are much more likely to be the first in their families to attend college, are much less likely to have parents who graduated from four-year colleges, and are more likely to be of lower levels of measured ability than students who attend four-year colleges. Two-year colleges thus appear to provide a place in higher education for those not traditionally served by the four-year college system.

Crucially, Rouse also finds that two-year enrollment levels are much more sensitive to tuition levels than are four-year enrollment levels. Simulations she conducts suggest that the major effect of increasing tuition levels is to reduce enrollments at two-year colleges, which affects primarily students who otherwise would not attend college. In judging the desirability of raising tuitions at two-year colleges, these results must be kept in mind.

In her conference comments, Maria Hanratty suggested that focusing on high school seniors' decisions the year they graduate may overstate the long-run effects of higher tuition levels. Higher tuition levels may lead people to delay entry into two-year colleges as they work to build up assets to finance their education. While there are social and private gains to having people obtain their college education as early in their lives as possible, delayed entry into college is a less dire consequence of higher tuition levels than is no entry at all.

The final paper in the volume by Donna Rothstein and myself deals with another choice in higher education, that made by black students in the United States to attend either Historically Black Institutions (HBIs) or other institutions of higher education. The HBIs are the public and private institutions that were established to provide higher education for black students who were formally excluded from southern segregated white colleges and universities during much of our nation's history.

HBIs have become the subject of intense public policy debate in recent years for two reasons. First, court cases have been filed in a number of southern states that assert that black students continue to be underrepresented at traditionally white public institutions, that discriminatory admissions criteria are used by these institutions to exclude black

students, and that per student funding levels, program availability, and library facilities are substantially poorer at the public HBIs than at other public institutions in these states. In 1992, the Supreme Court ruled that Mississippi had not done enough to eliminate racial segregation in its state-run higher educational institutions. Rather than mandating a remedy, however, the Court sent the case back to the lower courts for action.

What should the appropriate action be? Should it be to integrate more fully both the historically white and the historically black institutions by breaking down discriminatory admissions practices at the former and establishing some unique programs at the latter? Should effort be directed at equalizing per student expenditure levels and facilities between campuses, rather than at worrying about the racial distribution of students at each campus, even if such policies might result in "voluntary separate but equal" institutions? Or should HBIs be eliminated and their campuses either folded into the historically white institutions or abandoned altogether?

From an economic efficiency perspective, the appropriate policy response depends at least partially on whether HBIs provide unique advantages to black students that they cannot obtain at other institutions. To begin to address this issue, the first part of our paper uses data from the National Longitudinal Study of the High School Class of 1972 to ascertain whether black college students who attended HBIs in the early 1970s had higher graduation rates, improved early career labor market success, and higher probabilities of going on to graduate or professional schools than did their counterparts who attended other institutions.

We find that attendance at an HBI substantially enhances the probability that a black college student receives a bachelor's degree within seven years of starting college; however, on average, it has no apparent effects on the student's early career labor market success and on the probability of enrolling in graduate schooling. Thus, although black students in the 1970s uniquely benefitted educationally from attendance at an HBI, such attendance did not seem to yield an equal payoff in the labor market. Of course, as we note, and as conference discussant William Spriggs also noted, analysis of data from the 1970s does not necessarily provide a good guide for policy decisions in the 1990s. Consequently, in future research we will be updating these results using more recent data sets.

The second subject of policy debate relating to HBIs deals with the production and employment of black doctorates. Despite vigorous (or nonvigorous?) affirmative action efforts, the proportion of black faculty at major American universities is typically quite low. In part, this reflects the small number of black doctorates that are produced annually. Many

people stress the need to increase the production of black doctorates to overcome this problem.

What is the best way to increase the flow of black students into doctoral programs? Should new doctoral programs be set up, or existing programs strengthened, at HBIs to enhance the flow of black doctorates? Or should attempts be made to recruit more black students from HBIs or from other institutions into existing doctoral programs at leading research universities? In part, the appropriate policy responses depend on the answer to another question: Do those black undergraduate students from HBIs who go on to doctoral study and those who get doctoral degrees at HBIs fare as well in the academic labor market as do their counterparts from other institutions?

To begin to answer these questions, the second part of our paper uses data from the 1987 to 1991 waves of the National Research Council's Survey of Earned Doctorates. Among the major findings is that black doctorates who receive their undergraduate degrees at HBIs are much less likely to receive their graduate degrees at a major research institution than are those black doctorates who attend a major research or selective liberal arts undergraduate institution. Similarly, among the black doctorates who enter academic careers, those with graduate degrees from HBIs are less likely to be employed in major American research or liberal arts institutions than are those who receive their graduate degrees from major research institutions.

An implication of these findings is that one way to increase the flow of black doctorates into faculty positions at major research universities and liberal arts colleges is to make sure that more students from HBIs attend graduate programs in major research universities. Faculty at some of the HBIs have stressed to us, however, that the goal of integrating the faculty at major northern universities is not one of their chief objectives. More important to them is increasing the total number of new black doctorates. None of the results presented in our paper directly bears on this objective, but methods to achieve it will be another subject of our future research.

The issues addressed in this volume are all important ones for educational policy. How can we assure an adequate flow of new teachers in general, and science and math teachers in particular, in the decade ahead? How can we maintain or increase the quality of our teachers? Should tuition levels at two-year public colleges be kept below those at four-year public colleges to guarantee access for students who otherwise would not attend college? What should public policy be toward Historically Black Institutions of higher education? How can we increase the

number of black faculty members at major American colleges and universities? By both providing some answers to these questions and raising some new ones, this volume makes substantial contributions to the policy debate.