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ABSTRACT

This paper is a combination of two separate essays, both of which examine changes in standards for student and teacher performance in various states over the past two years. Part 1 examines changes in standards for graduation from high school and the introduction or expansion of statewide programs of testing. Changes in the overall units for graduation, in the mix of required courses, and in the extent of exit examinations are shown to have had an adverse effect on low achieving students, so methods are considered for retaining low achieving students through dropout prevention programs and through establishing effective learning environments. Thereafter, Part 1 summarizes what is known about the relationship between testing, achievement, and accountability in light of the expansion of state testing programs. Part 2 addresses changes in standards for entering and remaining in the teaching profession, and includes a brief discussion of teacher salaries in relation to changes in standards. The objectives are to examine the assumption that the academic or intellectual abilities of the teacher work force are inadequate, and to assess the costs and benefits of some of the strategies for improving the teacher work force. Each major proposal for increasing teacher quality is explored for its ability to improve the mix of teachers. These proposals include raising entry-level requirements, raising salaries, waiving certification requirements, and removing unqualified or incompetent teachers. The section concludes with the observation that these reforms will cost a considerable sum and may conflict with other manpower objectives. A 99-item bibliography concludes the document. (TE)

National Association of State Boards Education

REGULATING EXCELLENCE

Examining Strategies for Improving Student and Teacher Performance

A Publication of

National Association of State Boards of Education
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SUMMARY

This paper is in two parts and is a combination of two separate essays. Both parts of the paper are devoted to examination of the changes in standards which have taken place in states over the past two years. Part One deals with changes in standards for graduation from high school and the introduction or expansion of statewide programs of testing. Part Two addresses changes in standards for entering and remaining in the teaching profession. Part Two also includes a brief discussion of teacher salaries in relation to changes in standards. A second, companion paper has also been written, which discusses reforms in teacher pay emphasizing efforts to design and implement salary incentive programs.

This paper, on changes in the standards proposed and established at the state level for student and teacher performance, identifies the major reforms which are taking place and considers the potential of those reforms to accomplish their intended goals. The discussion is, of course, speculative, since the actual results of these policy changes will not be known for several years. Although policies discussed in this paper have already been enacted in some or most states, the assumption underlying the discussion is that there are still opportunities to consider, augment, and reconsider their content, as implementation proceeds.

PART ONE: STANDARDS FOR STUDENT ACHIEVEMENT

Graduation Standards

Three types of changes have taken place over the past two years--in overall units required for graduation, in the mix of required courses, and in the extent of exit examinations. Of these three, the changes in the mix of required courses may have the greatest impact on students as a whole, while all three changes could have substantial and negative impact on low achieving students. This section examines the rationale behind toughened graduation requirements and its relationship to the reforms that have been introduced. The section concludes with consideration of ways to retain low achieving students, both through dropout prevention programs and through establishing effective learning environments.

Statewide Testing

This section summarizes what is known about the relationship between standardized testing, achievement, and accountability in light of the expansion of state testing programs. There is considerable evidence that tests can have direct effects on achievement although such evidence is balanced by research which suggests that tests foster undue emphasis on specific learning skills, are not used effectively in student "diagnosis," or lead to undesirable teaching behavior. Standardized testing may also allow for greater system accountability. There is considerable agreement that testing is a powerful mechanism for use by state policymakers in influencing classroom practice. While some believe it is a dangerous tool, others believe it can be one of the most efficient ways to define the curriculum. Teachers fear it may also be used to judge performance.

Part One concludes with consideration of reasons for the decline in student achievement. It suggests that one possible explanation for decline lies in the decreasing economic returns to a high school diploma as well as the increasing access to college even without high grades in high school. This explanation is provocative, for it raises questions about the ability of the new reforms to increase achievement.

PART TWO: STANDARDS FOR TEACHER QUALITY

The objectives of this portion of the paper are to examine: 1) the assumption that the academic or intellectual abilities of the teacher workforce are inadequate; and b) the costs and benefits of some of the strategies for improving the teacher workforce. The first objective is addressed through a review of research on teacher characteristics that predict student achievement, effective teaching practices, and recent demographic trends in teacher recruitment. Possible policies are then discussed in light of this research, and in terms of their compatibility with other manpower objectives in teacher recruitment. The paper draws a distinction between policies designed to raise minimum standards by attracting well-qualified or weeding out the least able teachers, and those designed to reward the most capable teachers. This paper examines the goals and potential consequences of the first set of strategies.

Two types of research inform current efforts to reform teaching. One type is input-output, attempting to link student achievement to teacher characteristics and other "input" into education. The one teacher characteristic strongly associated with achievement is general intelligence level or academic ability, although there are few studies of that trait. "Effective schools" research also considers teacher characteristics. In general, teachers who believe they can be effective, spend the greatest time on task, and engage in active instruction are held to have the greatest impact in the classroom.

There appears to have been a decline in the quality of those entering the teaching profession over the past decade. Given the findings about what makes for teacher effectiveness, this decline is quite unsettling. Each major proposal for increasing teacher quality is then explored for its ability to improve the mix of teachers. These include:

- Raising entry-level requirements
- Raising salaries
- Waiving certification requirements
- Removing unqualified or incompetent teachers

The section concludes with the observation that almost any of these reforms will cost a considerable sum and may conflict with other manpower objectives.

PART ONE: STANDARDS FOR STUDENT ACHIEVEMENT

This portion of the paper considers changes in both graduation standards and standards of student testing. Changes in these two areas have been the most common in state efforts to affect student achievement directly. Both state boards of education and state legislatures have enacted these reforms. In some instances these bodies have acted independent of each other, while in other cases legislatures have mandated that boards determine the precise nature of the broad reforms that legislatures have passed. Other policy actors have contributed as well. Most notably, governors have convened commissions which have recommended policies for legislative and/or board action. Both the pace and the range of actors in reform have been unprecedented. This section of the paper considers some of the implications of those efforts.

Graduation Standards

In the past two years almost every state in the union has considered, and most have enacted, new and more rigorous standards for high school graduation. The extent of policy development is in stark contrast to the availability of information about what is or can be achieved at varying levels of course or unit prescriptiveness. Little of nothing is known, for example, about whether a state or district which prescribes two years of mathematics for high school graduation produces graduates with greater mathematics competence than a state which prescribes one year of mathematics. Nor is it clear that more specifically delineated unit content is more likely to result in student knowledge of the subject matter specified. What has driven reform has not been knowledge of policy outcomes, but rather frustration with current levels of academic achievement among high school students, particularly those planning to attend college.

The national dissatisfaction has resulted in actions by the vast majority of state boards of education and state legislatures to increase the number of units required for graduation, and to specify how those units must be distributed across subject areas. According to last year's Education Department follow-up to the report of the Commission on Excellence in Education, 35 states had enacted new graduation requirements by May, 1984 and thirteen more were likely to take action in the next several months. (U.S. Department of Education, 1984) A quick perusal of the descriptive information in that report reveals that the most common changes were increases in overall unit requirements from totals of 17 or 18 Carnegie Units to totals of approximately 20 to 22 such units. The additional units were most likely to be allocated to mathematics and science although several states also raised the number of years of social studies and English (or comparable subject matter) and added requirements for some combination of vocational education, foreign language, arts or computer science/literacy. In addition to changes in unit and course requirements, at least a dozen additional states enacted some form of exit examination for a high school diploma.

In general, there appears to be a trend to specify the ways in which units are acquired and to increase the total number of courses as well as the total number of required course. The effort to reduce student choice of courses appears motivated by the assumption that apparent declines in student performance are due, at least in part, to declines in the number of core

courses students have been taking. This section reviews the specific changes in graduation requirements which have been enacted, and considers some of the implications of those changes. In particular, it considers those effects for students at risk.

Units

During the past year and a half at least 33 states and the District of Columbia have increased the number of units needed to graduate from high school. For most states, increased units are required from the ninth through the twelfth grades, although in a few states unit increases are mandated for grades ten through twelve. While the states continue to differ on the total number of units necessary to graduate, most states appear to have added approximately 2 or 3 units to the total required course load. Translated into actual course hours, this means that a student taking the minimum number of courses in a typical state would be required to take approximately one additional course per semester for two or three years in order to graduate. While the definition of a unit may vary somewhat from state to state, students taking the minimum course load would spend around 40 to 50 additional minutes in classroom instruction for two or three of their four high school years. A few states, including Florida, Louisiana, Alabama, Georgia, Missouri, and Oregon have mandated 22 or more units (up to 24 in Florida) for graduation. Such requirements mean that all students would attend more than five credit-bearing courses during most of their high school careers (24 units translate into six unit-bearing courses each day for four years).

Some school districts in virtually every state already require students to take units in excess of state requirements and, even where additional requirements are not in effect, many students probably take more than the minimum number of classes. In addition, many of the students who are taking minimum numbers of units are probably present in school for more hours -- occupying the additional time with study halls or other activities. Nonetheless, the additional credits for graduation will probably extend the number of instructional hours in some schools and districts -- a potentially costly item. One state has also adopted a policy specifying that each school must offer at least 38 possible courses as a way to ensure that a range of additional units and course offerings will be available to students.

One implication of increasing total units is its potential to affect students who do not currently attend high school for a full day. Among 1982 high school seniors, almost one-third (32%) were spending one period or more per day out of school in community service or jobs; 17% spent a half day or more out of school. (NCES, April 1983) Ten percent of 1982 high school seniors reported having participated in cooperative education and 12% had participated in work-study (which may entail four hours of school and four hours of work). According to one study, 12th graders who work, work an average of 15 to 18 hours per week. Such non-full-time arrangements have been possible because the total number of units needed to graduate could be acquired during a partial day program. In some of the states which have increased the unit requirements for graduation, that opportunity has now been eliminated or seriously eroded.

While studies of students' work have found that many students are working for reasons other than financial necessity, little is known about the effect of reducing the opportunity for work, or other out-of-school activities during the school day on students' motivation to continue their education. We do know that over 50% of high school seniors consider work more enjoyable than school. (NCES, April 1983) To some extent, the flexibility and released time allowed under present policies may operate as a "safety valve" for students who are not planning to continue their education.

There is evidence from the High School & Beyond survey, however, that students who work large numbers of hours per week are more likely than other students to drop out of school. (Barro, 1984) Small numbers of hours of work do not appear to affect dropout rates significantly. Although it is unfair to attribute causality to such findings, it might be the case that increases in unit requirements which affected a student's ability to work long hours might be beneficial for some students. Little is know, however, about the possible countervailing economic effects of such restrictions. Students who work long hours may be those most in economic need, and restricting the opportunity further could hasten departure from school.

Increasing the amount of school time not only takes time from work, it also takes time from other non-academic experiences -- such as extra-curricular activities. Additional courses mean more class hours (and possibly more homework). For many students who are not high achievers (those most likely to be affected by additional unit requirements) such out-of-class activities may be critical to their identification with school, and reductions could affect their willingness to persist.

A secondary effect of increased required hours is to raise the issue of what students should be doing during their additional classroom time. Since these unit requirements are most likely to affect students who were not inclined to take more than the minimum number of courses previously, it is probably not reasonable to believe that additional classroom time will, in and of itself, cause these students to increase their desire for education. In fact, the opposite might be true -- requirements to spend additional time in the classroom may cause such students to become even less enchanted.

Increasing required units also raises a question about the relationship between the reform and the desired outcome. If the reform is motivated by a concern that students are spending less time on academic subjects than previously, and a belief that increasing course hours can lead to better performance, those assumptions have not been examined carefully. For one thing, most of the evidence of decline cited in recent task force and commission reports is based on the performance of students at the high end of the academic scale -- those taking college entrance examinations. Most of these students are likely to be taking more units than are required by all but a few states, even with the recent reforms. As a result, they are unlikely to be affected by the increase in units for graduation.

It is students at the low end who will be affected by unit increases, and it is by no means clear that the performance of these students has declined concommitantly with the performance of those academically average or above overall. A recent Educational Testing Service study which compared academic

achievement of high school seniors in 1972 and 1980 found that academic decline was most evident among whites and students of upper or middle class status. It concluded that "Federal and state programs designed to strengthen basic skills in reading and mathematics appear to have prevented comparable score declines among low socio-economic status blacks in vocabulary and reading and to have contributed to score increases among this same group in mathematics." (Rock, et.al., 1984) At the same time, there is strong evidence from both observational studies and High School & Beyond that students who are poor performers are more likely to drop out of school. (Barro, 1984) So while there is little evidence of decline, enforcing more hours in class for poorer performers may increase feelings of failure and exacerbate alienation from learning.

Exit Examinations

At the same time that unit requirements have been stiffened, at least a dozen states have introduced new statewide exit examinations for high school graduation in the past two years. Part of the impetus for this reform appears to be the idea that graduation from high school no longer ensures that a student can perform competently on the basic skills taught in formal education. Given that far more students are graduating from high school than was true historically, this observation is probably correct. An additional consideration in the introduction of such tests appears to be the notion that some students have been shortchanged -- they have not been provided with an education adequate to perform. The exit examinations, if offered early in high school and repeated as needed, can document difficulties and lead to remediation. In short, exist examinations have implicit or explicit quality control and diagnostic functions.

Exit exams (and competency testing generally) have other potential effects as well. Most importantly, they can shift the basis for promotion from grade to grade or for granting a diploma. If introduced and enforced, such exams affect those at the low end of the achievement pool almost exclusively, changing the currency of academic attainment from time to performance. Such a change has considerable potential for retaining in grade students who are performing poorly. Retention in grade has potentially powerful effects. From the High School & Beyond data we have learned that over-age students are far more likely than other students to drop out before graduation.

There is little direct evidence of the effects of exit exams on student performance or retention. There have been continuing complaints about all minimum competency testing, however, centering on the fear that such tests will increase feelings of failure on the part of students who are doing poorly and rather than challenging them to perform, will frustrate them and cause them to hasten their departure from school. Analysis of High School & Beyond data reveals that school districts with minimum competency testing have higher drop out rates than districts without such tests. The effect is not powerful, however, and it is not clear whether there is any causal relationship between the two phenomena. The relationship between minimum competency testing and higher-than-average drop out rates could have an alternative explanation. It might be the case that districts with poor achievement (and high drop out rates) are more likely to introduce such tests as a way of raising achievement or increasing accountability.

Some observers have made an argument for competency testing as a means of increasing achievement, but only if that testing focuses on competencies above the minimum. Assuming that this type of competency testing would result in curriculum change because teachers would teach to the tests, they support competency testing because they believe that it can have powerful positive indirect effects on curricula and student achievement. (Resnick and Resnick, 1982) Exit examinations which sought to test above minimum levels would result, however, in the denial of a diploma to some or more differentiated diplomas.

Course Requirements

Beyond additional units and exit examinations, states have increased the number of units required in core curricular areas, most notably English, mathematics and science. Many states have raised mathematics and science requirements from one to two units in each area and a few have raised the requirements to three years in one (or both) areas. Several have specified the types of mathematics or science students must take -- e.g., one unit of chemistry or one unit of laboratory science. Beyond increases in total units, increasing the number of units required in these "core" curricular areas is probably the most common reform of student academic standards in the past two years. The increases in units in "core" subjects underscore one of the major threads of reform, the notion that there is a body of knowledge students should acquire and that the body of knowledge requires greater attention to certain academic subjects than is now the case. Reforms proposed and enacted in many states are designed to result in large numbers of students taking far more of these subjects than presently.

There is growing evidence that few students were taking a curriculum rich in core courses prior to this set of reforms, and considerable evidence that the numbers so doing were continuing to decline. According to one study completed since the Commission on Excellence in Education issued its report, the percentage of students completing the "New Basics" curriculum advocated by that Commission was approximately 16.4% in 1969 (19.5% if the foreign language requirement is excluded) and 8.4% in 1980 (13.5% if foreign language is excluded). (Alexander and Pallas, 1983) It appears that while fairly large numbers of students completed a substantial portion of the curriculum through the 11th grade, there was a considerable drop-off in students enrolled in the final year of the curriculum. It should be noted, however, that the New Basics curriculum included three years each of mathematics and science, and only a few states have enacted requirements for more than two units years in each of these subjects.

According to the same data, 80% of the 1969 graduates had completed two years of math and 69% had completed two years of science. Of students not in the academic track, however, the rates of completion were much lower: around 50-60 percent in both subject areas. Self reports of high school seniors in 1982, indicate that 31.8% had taken less than two years of math in grades 10-12. For science, 47% report having taken less than two years. As for specific courses: 45.3% had never taken geometry and 22.1% had not taken algebra. (NCES, April 1983) The ETS study finds that 1980 seniors took fewer semesters of social studies, science and foreign language than their 1972 counterparts but more semesters of mathematics and reported doing less homework. Most of

the change in courses taken was among students who were in general or vocational tracks. Significant numbers of students shifted out of academic and into those tracks during the decade. (Rock, et.al., 1984) It is for students such as these that the current reforms will be most significant.

Of all the changes in graduation requirements, the increase in the number of required academic courses is a departure from existing practice that could affect large numbers of students, including students who are performing relatively well. Implementing this reform has substantial implications for the cost of education, the array of teachers, and the educational experience of students. It goes almost without saying that reforms which may double state minimum requirements in science and mathematics will exacerbate an already substantial dearth of certified math and science teachers. In communities which are still experiencing declining enrollments and cannot afford to hire additional staff, the end result could well be more teachers instructing in areas for which they are partially or not at all qualified. Even in communities where enrollments are either not declining or increasing, the ability to attract high quality science, math, or other teachers depends on increasing the attractiveness of teaching in the face of competing professional opportunities. They are now in the position of seeking to improve the quality of the workforce while at the same time having to attract more teachers than in the past. The combination could put a considerable strain on scarce resources.

Further, the changing subject requirements may change the mix of subject areas which must be offered in any given school or district. Assuming that a school is offering courses in keeping with previous state requirements, more required courses in mathematics, English and science may be balanced by less opportunity to choose electives. Such changes may result in diminished opportunities for teachers in elective or personal service courses such as family living or driver education or home economics, who can not teach in the new areas, but who still must be paid. The availability of these teachers may encourage out of subject teaching, perhaps with a minimal amount of retraining. Out of subject teaching is a separate and considerable problem and was criticized even before this round of reform.

Unlike increases in unit requirements or exit exams, changes in the mix of courses required for graduation may very well affect substantial numbers of students, especially those in non-academic programs. These course changes would affect students in districts which may have requirements considerably greater than previous statewide minimums and students who are performing at or above average academically. Assuming that only 13.5% of high school seniors were taking the New Basics curriculum in 1980, it seems likely that large numbers of students were also completing a full program with considerably less than two years of science, two years of math and four years of English. There is little doubt that state policymakers have, through these changes, sought to increase overall exposure to core curriculum and, presumably, achievement, for students at all performance levels.

The possibility of affecting student achievement positively through the introduction of requirements for more core courses is reinforced in the work of Alexander and Pallas (1983). Analyzing the potential impact of the New Basics curriculum proposed in A Nation At Risk, they find that completion of the curriculum has considerable, positive affects on overall student achievement.

It should be noted, however, that completion of the full curriculum is critical. Achievement does not appear to be incremental. Skipping the last course in the sequence (e.g., the third year of science or math, for example) means losing most of the curriculum's achievement benefit. Most states have not mandated the three-year science or math requirements which Alexander and Pallas conclude make the difference. Significantly, however, for poor performing students completion of the curriculum has few if any achievement benefits.

Further evidence of the potential positive impact of the academic challenge implicit in more core courses is found in recent studies by Natriello and Dornbusch (cited in McDill, et.al., 1984). They found that when students are confronted with an increased academic challenge, they tend to devote more time to education -- i.e., they pay more attention in class and spend more time on homework. This result was most pronounced for high-ability students, however. Low ability students can become frustrated if the pace exceeds their ability to master material.

For students who are doing well, or who are capable of doing well but are "coasting" on electives, the challenge of additional years of mathematics or science may prove a worthwhile experience. For less capable students, however, more math and science may exacerbate existing performance difficulties and increase frustration with education. The problems could be amplified by the introduction of a new and possibly minimally trained cadre of mathematics and science teachers mandated to teach these courses to students who would not have taken them previously. A few states which have increased requirements have also taken steps to allow course substitutions for students in vocational or other programs than college preparatory, but the vast majority have not. In fact, several states have gone farther than introducing additional years of math or science to mandate specific courses or types of courses as well; e.g., two years of laboratory science (South Dakota), or one year of geometry and two years of algebra (Louisiana). In an educational system in which 48.5% of 1982 high school seniors report having taken two years of algebra previously, such changes could have dramatic effects. (NCES, April 1983)

The considerable disparity between such state requirements and existing practice suggests that districts and schools will find new ways to accommodate their needs and students' interests to the new requirements, or the requirements will be modified, or both. As one group of researchers points out, the content of academic courses is often affected by a desire to make instruction practical and interesting. Even in the same course, changes are made when information is presented to groups of students with lower academic abilities. (Resnick and Resnick, 1982 and 1985) Since most of the new requirements are not scheduled to be fully operational until 1987 or even 19[illegible], the adaptation and modification process will probably take place gradually over the next few years. It may take several forms: local definitions of requirements that mitigate what appear to be tough standards, state guidelines which broaden definitions of science, mathematics or other subjects to include subjects which have not, traditionally, been considered science or math, or (less likely) further changes in state requirements which weaken the impact of previous reforms.

One of the first areas in which state definition may take place is in the area of computer education. Over the past two years at least eight states have mandated that students take one-half or one unit in computer science or computer education or computer technology. Several additional states have mandated that all students be computer literate in order to graduate, or have given students the opportunity to substitute a unit or half unit in computer education for some other graduation requirement. Until this round of reforms, no state had any comparable requirement. There are few teachers with certification in these areas and little professional agreement on the content of instruction in computer courses. Few students, regardless of academic standing, were taking computer education courses prior to these mandates.

What happens to the requirements for computer education may be a good test of what happens to new requirements in other subject areas. Whether this requirement results in new education and new courses for all students or is redefined to enable schools to make few changes in curriculum (particularly for students who are not interested in learning about computers or do not have the basic skills to use computers effectively) will be a good test of the overall capability of the new requirements to shape education.

The Extra Curriculum

At the present time only a relative handful of states has introduced requirements to limit student participation in extra-curricular activities. Like graduation requirements, however, most such reforms are focused on high school students. For example, students in South Carolina must pass four courses in order to participate in sports. In Delaware, students must pass four courses, of which two must be core courses, in order to participate. Alabama has curtailed extracurricular activities during the school day. Texas seeks to limit participation to students who obtain C grades and have low absenteeism rates, as well as limiting total hours of participation for all students. (Education Week, 1985)

It is hard to gauge the effect of such regulations. It is unclear, to begin with, whether such rules are passed out of concern that student participation in extra-curricular activities takes time away from learning, or because extra-curricular activities are viewed as a reward or incentive for good grades. According to self-reports, about 7% of high school seniors have grade averages of below C. (NCES, April 1983) We do not know what percentage of those students are likely to participate in extra-curricular activities in places where these rules are not in effect. Since these regulations are intended to have psychological or motivational effects as well as limiting actual participation, it would also be important to know whether marginal students would be motivated to achieve in order to participate or whether the closing off of this option would have no effect or lead to discouragement.

Excellence and Equity

Despite this rather depressing sense that the current round of reforms is unlikely to affect, positively and could affect negatively, the achievement of students who are at the low end of the performance spectrum, there are reforms which could be directed to those students and which have a likelihood of improving achievement and retention. It would seem critical to introduce such

reforms at the present time, simultaneous with the introduction of excellence reforms, in order to forestall the possibilities of educational disillusionment for those performing poorly. Observers have suggested a variety of reforms that states and school districts can undertake. Those reforms are largely of two kinds -- those aimed at improving the effectiveness of schools in general, and those aimed, directly, at students who are likely to drop out.

A. School Improvement Reforms:

Critics of recent increases in course and graduation standards have argued that a more effective approach to both increasing achievement and preventing educational alienation is to concentrate on classroom and school building reforms which have shown promise of achieving both goals. Some of these critics are skeptical of the ability of uniform, state-imposed unit or course requirements to affect education in the classroom, and prefer to identify the teacher, classroom and school behaviors which are related to higher student achievement. Although providing little guidance for how state policy can encourage the adoption of such practices, their work serves to highlight specific changes which have a likelihood of improving practice and performance. (see e.g., McDill, et.al., 1984)

Research over the past decade has focused on identifying the characteristics of schools which appear to be successful (i.e., schools where students learn and disruption is at a minimum) and those which appear to be unsuccessful (i.e., schools with high rates of dropout or absenteeism and low rates of performance). Schools which are successful have in common such characteristics as clear rules and consistent enforcement, small size, support for academic achievement, flexible schedules, teacher-administrator cooperation, emphasis on instruction rather than simply on maintaining order, individualized, self-paced instruction, and rewards based on individual accomplishment as well as, or in lieu of, performance in comparison to others or to absolute standards. (Cohen, 1983) Schools with poor performance lacked these characteristics. The challenge for policymakers is to construct broad rules -- through laws and regulations -- which encourage the establishment and maintenance of successful schools.

B. Specific Drop-out Prevention Efforts

Another way of approaching reform is to assume that increases in units and courses as well as exit exams and restrictions on extra-curricular activities will benefit average and higher ability students. What is required, therefore, is not a different set of reforms but additional assistance to those who may suffer: the poor achievers and those who are already alienated from education. Both groups have the potential to drop out, so what is needed are specific programs aimed at remediation and/or drop out prevention. In order to meet the needs of those groups, it is necessary to examine what is known about the effectiveness of specific efforts to stem dropping out.

For some students, dropping out is related to conditions that may have their origin not solely in educational performance but in personal factors which can affect educational continuation. For example, a substantial percentage of such students are adolescent parents, who find it impossible to combine childraising with school attendance. To the extent that such students

have been able to stay in school or return to school, the reasons lie in both personal motivation and educational flexibility: special programs, shorter hours, greater personal attention, remedial instruction, and the like. The movement to provide options could be sorely tested as the new standards take effect, but the need for flexibility may never be greater.

For students as a whole, successful dropout prevention efforts have several common characteristics (identified by Hamilton, 1985): they separate potential dropouts from other students, they have strong vocational components, they utilize out-of-classroom learning, and they are carried out in small groups using individualized instruction. While the desirability of separating potential dropouts from other students and providing a vocationally oriented program leads to debate about mainstreaming and tracking, there is evidence from a variety of sources that such programs can have a powerful benefit in ensuring educational continuation and graduation (and, thereby, doing a great deal to equalize educational outcomes). Since most of the recent changes in standards will most likely require more time in classrooms, fewer opportunities for vocational education, and more academic demands on marginal students, it seems reasonable to argue that carrying out drop out prevention requires a willingness to relax or mediate these standards for students at greatest risk.

Statewide Testing Programs

While difficult to characterize as excellence reforms entirely, state policymakers have been extending statewide testing mandates in the wake of demands for greater student achievement. In specifying changes, states are prescribing that specific tests or a range of tests be used to establish not only whether students have achieved minimum levels of performance but also for overall student performance assessment. States can also use systematic student testing programs to assess teacher, school or district ability to provide students with an adequate education, and to affect the content of the curriculum.

State-required tests are not new; the popularity of minimum competency examinations has been increasing for some time. What appears to have accelerated in the past two years is the extent of state testing beyond that required to establish minimum competency, including: 1) state-mandated achievement tests at a larger number of grade levels; 2) state-mandated testing in a wider range of subjects; 3) state-prescribed testing for diagnosis and remediation; 4) state achievement tests for promotion from grade to grade; and 5) state achievement tests for advanced diplomas.

According to one recent review, by the middle of 1984, 40 states had in place or were in the process of implementing minimum competency testing, including 19 states which already had or were planning to introduce tests for high school graduation. (Anderson & Pipho, 1984) A recent survey by Education Week indicates that seven states will soon require students to pass a test for promotion at some grade (February 6, 1985). At least half a dozen states are now proposing or have enacted examination programs for special, advanced, diplomas. Statewide testing mandates have become a leading mechanism for the exercise of state oversight of education.

While this description of the extent of the increase in statewide testing may sound as if the country is moving toward a uniform assessment program, it should be noted that the actual plans for testing vary widely among the states. Some states are adding grades to existing testing programs in basic skills, some are introducing or expanding the use of well-known standardized achievement test batteries to additional grades or additional subjects, some are conducting earlier administrations of the minimum-competency tests used in the granting of high school diplomas, and some are introducing additional criterion-referenced tests in specific subject areas (such as writing tests at the 9th or 10th grade levels) (Education Week, February 6, 1985).

The introduction or expansion of statewide minimum competency and standardized achievement testing programs probably says more about educational governance than about advances in the practice of student testing. American students already undergo more standardized testing than students in any other country. (Resnick and Resnick, 1982) It is estimated that the average student takes approximately six full batteries of standardized achievement tests between kindergarten and high school graduation. The General Accounting Office estimated several years ago that 90% of the nation's school districts administer standardized tests to at least some children each year. Unlike standard-setting for high school graduation which seeks to rectify a decline in the item mandated (e.g., students are taking fewer core courses so more core courses are mandated), there is little evidence that mandating more tests is compensating for a lack of tests.

Standardized Testing and Achievement

The expansion of state testing programs seems driven by more than a need to know how students in a state are performing. Underlying this unprecedented expansion of state testing policies are implicit assumptions about what testing can accomplish. Perhaps the most basic is the belief that testing can motivate students to achieve. While testing linked to the granting of diplomas may have a direct achievement effect, most of the current expansion is taking place through the introduction of testing which does not have direct rewards or sanctions for students. State policies which expand required tests but do not use those tests for promotion or advanced diplomas presumably are intended to have achievement effects because they expand the range of subjects to which students are exposed, because they diagnose and remediate learning difficulties, or because they make teachers accountable for students' performance at more grade levels, and hence, student performance improves.

There is reason to believe that testing can have affects on achievement. There is a growing body of evidence from school effectiveness research which suggests that testing creates standards, explicit goals, and expectations which improve the climate of classrooms and, hence, student performance. There is also evidence that a close overlap between curriculum and tests is associated with higher student achievement. Testing as a means of monitoring student performance is portrayed in effective schools research as a powerful device for learning.

On the other hand, a major recent study which tried to isolate the specific achievement effects of the introduction of standardized testing found no such effects. The study, which introduced standardized achievement tests in

Irish schools, did not find any effects of such tests on performance. (Kellaghan, et.al., 1982) Researchers noted that tests were administered but the results of testing were hardly used. Few changes in practice were introduced as a result of test findings, nor did teachers change their attitudes about students based on test results. Information from test results was not incorporated into instruction, in part because the kind of information reported did not lend itself to easy incorporation. Test information often confirmed what teachers or administrators already believed, but rarely resulted in changed judgments about students. As a result of these types of findings, some researchers have concluded that this type of standardized achievement testing is a poor instrument for improving student standards. (Resnick and Resnick, 1982)

Somewhat different are those state policies which plan to use tests for specific credentialing or promotional purposes. Some states are using either minimum competency or general achievement testing as a means to establish promotional gates. Although the number of states which have introduced gates at points other than high school graduation is still quite small, it is not unreasonable to assume that several of the recently enacted statewide assessment testing programs could become gate programs, since both types of programs may use the same tests. In addition, several states have introduced achievement testing for special, advanced diplomas.

While the incentive of promotion or an advanced diploma could seem sufficient for tests to affect achievement, there are still cautions to be sounded. There is considerable evidence that tests which matter have effects, but not always the ones that policymakers envisioned. Such tests can lead to a narrowing of the curriculum, undue emphasis on particular skills, and concommitant declines in student performance in areas not measured on the tests. Students will put their effort where it matters. Students will also change their style of studying depending on the way in which tests are constructed -- memorizing facts for true/false or multiple choice tests, identifying themes for essay tests. (Kirkland, 1971) Teaching to the test is reported in a host of studies, particularly when teachers perceive that the test will reflect on them as well as on their students.

In addition to the specific concerns about effects on instruction and student performance, the growth of statewide testing programs takes place against a backdrop of deep skepticism about the role of testing in student learning. State boards of education are aware of complaints that achievement tests may foster rote learning or fail to capture the quality of student learning, that they ignore high order skills, that reporting of test scores may stigmatize poor performers and frustrate further learning. Demands for quantitative information have led to the use of test scores in student decisions for which such information is inappropriate. Perhaps worst of all is the increasingly heard (contradictory) complaint that despite the widespread use of costly standardized tests, there is little solid evidence of any effects whatsoever (Tyler and White, 1979). The methodological problems of trying to construct valid, reliable, and useful measures of student performance that are independent of each student's unique educational experience are well known.

While the National Commission on Excellence in Education and the Task Force on Education for Economic Growth called for the introduction of

standardized tests at major transition points within public education, few of the other recent examinations of public education have dealt explicitly with student testing before college entrance exams. The Commission on Excellence in Education noted that, "The tests should be administered as part of a nationwide (but not Federal) system of state and local standardized tests." That the Commission did not pinpoint action on testing at a particular level of educational governance is probably a reflection of the broad range of current practices and controversy about the effects of testing programs.

Testing and Accountability

Apart from improving achievement directly through such practices as promotional gates, the expansion of statewide testing programs seems designed to increase student achievement indirectly through several possible accountability mechanisms. A second set of assumptions underlying reform is that testing programs are a means of enabling district oversight of schools, teachers, and administrators, as well as indirect mechanisms to define and set curriculum standards. While some observers contend that no one mentions "accountability" any more, and that norm-referenced tests which could make comparisons among districts simply have fallen into disrepute, state-prescribed testing programs continue to allow for comparisons and sanctions. (Alexander and Pipho, 1984) In its extreme form, one state proposes that a district may be dissolved if its students perform quite poorly on a statewide promotional-gates tests in grades 3 and 6 over an extended period of time.

One of the key mechanisms for state impact on achievement through testing is through the power of tests to influence curricula. Since one of the tenets of the excellence reform movement has been that declines in student achievement are, at least in part, attributable to declines in exposure to a core curriculum, a testing program that mandates assessment in more core subjects can not help but aid in exposing children to those subjects. During the past two years, a large number of states have increased the range of subjects to be included in state-mandated testing as well as the number of grades at which such tests are to be administered. In addition, some states have introduced examinations patterned on the N.Y. Regents Examination, which tries to ensure not only exposure to core subjects but attainment of a modest level of proficiency in higher-order skills.

The notion of using testing as a mechanism to define and specify the curriculum stands on its head one of the most common complaints about assessment testing -- that it encourages teachers to cover a specific body of information to the exclusion of other knowledge, in other words, instruction to the test. What was once thought of as undesirable, or problematic at best, is increasingly regarded as an efficient policy mechanism to bring about exposure to a set of subjects and ensure minimum levels of uniformity of practice across a state. (Linn, 1983; Resnick and Resnick, 1982, 1985) As Anderson and Pipho note, "a primary benefit of a testing program is that it highlights and defines the content to be learned." (1984) Thus, the policy issue becomes a technical one, whether there are good tests available which cover the appropriate range of skills and knowledge.

Unlike other alternatives for defining a body of knowledge all students should possess, such as specifying that knowledge in a set of curriculum

guidelines, the test is a potentially efficient device for defining the curriculum. It is easy to know whether the curriculum the test specifies is being implemented, teacher by teacher, school by school. To make that determination, state policymakers can simply observe student performance on the tests. Beyond defining curricula, statewide assessment testing programs provide a safeguard against programs which are inadequate and some guarantee that students will be exposed to specific information.

The problems with using tests to define the content of curricula are well known. Since assessment tests must be easy to administer and score, they generally include multiple choice questions, each of which has a single correct answer. This format has been attacked repeatedly for giving short shrift to higher order skills and student creativity. Large numbers of teachers are resistent to test-driven curricula, which they see as management control devices, eliminating their time and ability to teach in a manner they consider desirable. (Darling-Hammond and Wise, 1985)

Even when tests are developed which seek to overcome the problems inherent in the multiple choice format, the curriculum results are not always encouraging. For example, teachers sometimes complain that the N.Y. Regents Examination essay test has resulted in an semester course given over to preparation for one type of essay writing -- a five paragraph argumentative essay on a topic about which the author may know nothing -- while all other types of writing are almost ignored. Wise and Darling-Hammond report that teachers are particularly resentful of competency-based instruction which is designed to link testing and instruction (1985). While it is true that all schools can not teach all knowledge to children, tests may be a poor or inadvertent way of focusing or narrowing the curriculum.

An exception to increased state control of the curriculum through testing is those state mandates which call upon districts in the state to develop testing programs aimed solely or primarily at individual student diagnosis and remediation. While this approach constitutes a statewide program in the sense that it is state required, it lacks other properties associated with statewide testing programs -- particularly uniformity of practice, uniformity of reporting, and sanctions for poor performance. Equally important, it may allow districts the latitude to fit the state mandate to already existing local testing programs.

A second accountability device which links testing programs to excellence reforms is the potential of statewide testing programs to provide information about teacher (or administrator) performance based on student outcomes across schools and even districts. While such information may be important for ensuring minimum levels of educational quality, it may also be used to set salaries, develop merit pay or career ladder programs, or engage in other performance-related evaluation. Although state policies on assessment testing often prohibit the use of such tests for teacher evaluation, teachers are already concerned about the relationship of cross-classroom testing to performance assessment.

It has become the conventional wisdom that standardized tests are much administered but little used. Information is rarely reported in a timely enough fashion to allow teachers to incorporate the information in instruction.

Preparation for and administration of assessment tests may take considerable time away from instruction for few achievement benefits. Even if all of these charges are correct, however, the accountability opportunities inherent in statewide testing programs, particularly the ability to shape local practice, may make such programs worthwhile. From this perspective it may not be the testing process alone which affects education achievement, but the testing program as creator or reinforcer of "standardized" content. Added to growing efforts to make tests the determiners of promotion and diplomas, these accountability functions could make tests "matter" in a powerful manner.

Explaining Academic Decline

Unit, course, or testing requirements are all designed to remedy a perceived slippage in the effort expended on education by students at the secondary level. There is increasing evidence that the Commission on Excellence in Education report was correct; fewer students were taking advanced courses in 1982 than in 1972. Added to that evidence is a body of knowledge which argues, convincingly, that greater time devoted to instruction is positively related to achievement. The result are proposals to increase time in school and time in academic courses.

The current reforms address both concerns simultaneously. Unit increases and additional course requirements are designed to increase the exposure to advanced courses as well as the amount of time that students spend in intellectual pursuits. Unit requirements alone mean more time in the classroom. Course requirements mean that more students will be taking more core courses in the near future. At the same time, exit exams mean that even students who continue to devote little attention to school work will have to demonstrate minimum competency in order to graduate. The next phase of reform promises to bring about more specific, uniform definition of the content of academic courses.

What none of the reformers and few of the policies address, directly, however, is why students have been taking fewer advanced courses and performing less well, especially those students who are taking college entrance examinations. Implicit in many reforms are assumptions about why the decline has occurred. Some believe that students have become lazy, perhaps as a function of a general weakening of the social fabric. There is a belief in several of the recent reform commission reports that the academic decline of students is, somehow, linked to, or perhaps a result of, a more general decline in the position of the United States in the world. It is widely held that social and educational attitudes that schooling must be "relevant" are to blame. With such notions in mind, it is easy to see how one might conclude that the solution is simply to increase the requirements necessary to obtain a desired goal, such as high school graduation or college entrance.

What the statements of the problem and the reforms have overlooked, however, are competing notions of why students are taking fewer courses or fewer core courses and, possibly as a result, performing less well than a decade or two ago. Yet understanding the reasons for the decline would seem critical to designing policies which rectify the situation. Presumably, a policy which took into account the decisions that students have been making would stand a greater likelihood of providing the proper incentives to induce

students to perform. To date, there have been few efforts to provide a systematic explanation for change. One observer has tried, however, to explain the causes of the decline in student achievement beyond the view that decline in test scores is part of a social or educational malaise.

This alternative explanation for declining achievement is provided by Henry Levin in a recent article (1984). Levin argues that the amount of learning students accomplish is a function of four factors: the capacity of the individual, the time the individual devotes to learning, the amount of effort the individual gives to learning and the quality of the resources available for learning (the institutional input). Levin argues that the assumption in the current set of reforms is that greater requirements for expenditure of time in school (such as more units requiring more seat time or tougher courses) will improve overall performance.

According to Levin, time is only one of the variables that affect learning. While the institution has control of time, it has considerably less control over effort -- which is controlled by the student. If students do not listen or concentrate, more time will have little if any effect. Further, Levin argues, students expend effort to the extent necessary to obtain the rewards they seek. If the rewards are not sufficient (or increased), students confronted with additional time demands for the rewards will adjust by decreasing their levels of effort.

Levin argues that the current round of reform is just such a case in point. The time demands for a high school diploma are being increased, but good grades and the diploma itself are no more reward now than they have been until now. In fact, their extrinsic or economic worth has been declining for quite some time, and that decline, in part, explains the decline in effort (and, thereby, achievement) on the part of secondary students. Levin bases his claim for the declining worth of grades and the diploma on both the decline in economic returns to high school graduation and the diminished necessity of high achievement for college entrance. Over the past two decades the massive expansion of post-secondary education has all but eliminated competitiveness for slots in colleges. Almost anyone who graduates from high school can go to college. "The result is that the incentives to take difficult courses and achieve high test scores to gain college acceptance are much lower today than they were in the past."

These changes in the extrinsic rewards of high school completion are ones over which secondary education policymakers have little leverage. As a result, Levin concludes, school districts with limited funds would do well to weigh the costs involved in adding seat time. Those funds might better be spent on other reforms -- such as hiring more talented teachers, reducing class size, retraining teachers, or the like. These reforms stand a better possibility of improving achievement by improving the "intrinsic attraction of the schooling experience." It is the intrinsic quality and appeal of education over which education policymakers have some control.

While Levin's explanation is just one among many possibilities, this line of reasoning demonstrates the importance of considering the causes of a change in formulating policy responses. Not only does this theory try to explain the decline of enrollments in advanced courses and test scores and suggest

appropriate responses, the explanation allows for establishing priorities among competing reform proposals. Over the next few years the true costs and outcomes of extending seat time, introducing testing programs, creating merit pay plans, and expanding the availability of advanced courses will become clear. Attention to why decline has taken place (and what can or cannot be manipulated through the educational system) makes some a priori decisions about reform priorities possible.

PART TWO: STANDARDS FOR TEACHER QUALITY

Recent national reports on the condition of American education achieve consensus on the need to improve the teacher workforce, but hold divergent views about the best way to do it. Some reports call for more intervention, through regulation of teacher training institutions or restrictions on access to the profession. Other reports rely more heavily on inducements, rewards and incentives to attract and retain the best personnel. Some recent state reforms concentrate on improving working conditions, while others focus on redefining teacher tenure or increasing the qualifications that teachers bring to the job. Sprinkled through the current national debate are a wide variety of possible policy strategies including increasing standards at all stages of career preparation -- from admissions to schools of education through employment, raising teacher salaries, waiving certification requirements for non-education majors, and holding schools of education accountable for the performance of their graduates. Despite differences in emphasis, the policies enacted reflect widespread concern with recruiting and retaining academically able teachers.

The objectives of this portion of the paper are to examine: 1) the assumption that the academic or intellectual abilities of the teacher workforce are inadequate; and b) the costs and benefits of some of the strategies for improving the teacher workforce. The first objective is addressed through a review of research on teacher characteristics that predict student achievement, effective teaching practices, and recent demographic trends in teacher recruitment. Possible policies are then discussed in light of this research, and in terms of their compatibility with other manpower objectives in teacher recruitment. The paper draws a distinction between policies designed to raise minimum standards by attracting well-qualified or weeding out the least able teachers, and those designed to reward the most capable teachers. This paper examines the goals and potential consequences of the first set of strategies. Those policies designed to reward performance through incentives -- such as merit pay and career ladders -- are addressed in a compa ion paper.

BACKGROUND

Concern for the quality of the teacher workforce is not a recent phenomenon. Almost twenty-five years ago, John Gardner wrote in another commission report:

> "Until we pay teachers at least as well as the middle echelon of executives, we cannot expect the profession to attract its full share of the available range of talent. Salaries must be raised immediately and substantially. Almost as important as the level of pay is that the promotion policy for most school systems is routine and depends more on seniority than on merit. And the top salary is not sufficiently far above the bottom salary to constitute a meaningful incentive." (Gardner, 1961)

Since that time many national reports on education have come and gone. Recent reports have once more placed education in the national spotlight. Like the Gardner report, these new reports place considerable emphasis upon the quality of the teacher workforce, a subject relatively neglected in the last two decades.

During the 1970s, schools were urged to initiate or expand efforts to reduce youth unemployment, combat drug and alcohol abuse, overcome a perceived generation gap, and recognize the special needs of neglected sub-populations. To accomplish these goals, school personnel were told to become more relevant and interesting, provide more educational options and alternatives, and assist youth's transition to adulthood. In general, the reports of the 1970s had little to say about teachers.

The current reform effort is concerned centrally with the recruitment, preparation, selection and retention of teachers, with teaching conditions, salaries and other professional rewards. Report recommendations and state policies seeking to upgrade conditions of employment and the quality of the teacher workforce have enjoyed popular support. Governors, state boards of education, legislators, and local school districts have connvened task forces and enacted legislation and rules for improving teacher quality. Even teachers and their unions have accepted some of the approaches to increased standards that they opposed in the past.

The report that received the most attention, A Nation At Risk, included seven recommendations to "improve the preparation of teachers or to make teaching a more rewarding and respected profession." (National Commission on Excellence in Education, 1983) These recommendations include raising standards for admission to teacher training programs, tightening accreditation standards for training programs and certification requirements for job applicants, raising teacher salaries and tying pay increase to job performance, providing eleven month teacher contracts for professional and curriculum development, developing career ladders within teaching, opening employment to non-certificated personnel with subject matter expertise, and providing financial inducements to attract outstanding students into teaching. Other reports have similar themes, although not all strike a sense of national crisis.

Despite differences in emphasis, the reports reflect convergence around several themes. These include the need to recruit more academically able teachers, to emphasize expertise in subject matter skills, to raise teacher salaries, and to tighten certification standards while opening employment to bright individuals who may not have been trained in the field of education. Taken separately, these approaches constitute different, though not mutually exclusive, policy options. Each suggests a course of action. As a package, these five approaches could overhaul substantially manpower policies in the field of teaching. These options are to:

- o Raise the quality threshold for entrance into the teaching profession at various stages in career preparation. Proposals include raising criteria for admissions to teacher training programs, raising graduation requirements, and testing teacher applicants for proficiency in basic skills, subject matter or pedagogy. At present, most teacher training institutions practice something close to open enrollment (fewer than 10 percent of all applicants are rejected). Any proposal to raise admissions standards significantly would exacerbate the current pattern of declining enrollments in teacher training institutions. Recognizing that many schools of education are unlikely to tighten standards, states are instituting competency testing for prospective teachers. The vast majority of current

teachers would be unaffected, however for this requirement usually is restricted largely to incoming teachers. Whether restrictions are imposed on access to training, on job entry, or both, these proposals have implications for the supply of teachers, and the price they must be paid.

- o Increase the pool of qualified candidates by raising teacher salaries or by opening employment to non-certificated personnel. During the 1970s, teacher salaries lost ground both to inflation and to wages paid other college graduates. Proposals for higher teacher salaries are designed to make teaching more financially attractive, and enable districts to be more selective in whom they hire. Likewise, eliminating requirements that teachers complete a prescribed series of education courses enables those with education or experience in such areas as scier , math and foreign languages to become teachers. While enhanced salaries alone are designed to increase the pool and raise quality through more rigorous screening of prospective teachers, certification waivers would open employment further to those with presumably high college achievement but little or no pedagogical preparation.

- o Remove teachers who fail to "measure up" by requiring periodic recertification, by testing current teachers for basic competency, and by streamlining procedures for removal of tenured personnel. Since efforts to remove tenured teachers on grounds related to their teaching competence are financially and administratively burdensome, they are largely ignored. In the hopes of avoiding the problem, increasing numbers of states are mandating a year of internship prior to teaching certification. Proposals for additional testing or periodic reevaluation of already certified personnel are proving to be among the most controversial.

- o Improve the quality of teacher training by raising requirements for institutional accreditation, by placing greater emphasis on subject matter competence, and by requiring more extensive pre-service apprenticeship. Each of these proposals has important implications in its own right and in relation to the others. For example, tightening accreditation standards could mean holding institutions accountable for the performance of their graduates. Were accreditation practices to move in this direction, schools of education would almost certainly respond by denying admission to higher-risk students. This would have an impact on the entry of blacks and other minority groups into the teaching profession. At the same time, another set of proposals is designed to reduce the control that schools of education have over the preparation of teachers. Proposals that emphasize subject matter skills (through courses taken in non-education departments) and pre-service training in the classroom may not always be consistent with efforts to hold teacher training institutions accountable for the performance of their graduates. These and other proposals reflect a high degree of uncertainty about the best way in which to prepare teachers.

- o Establish financial rewards and other types of recognition for high

levels of teacher performance. Among the suggestions have been the development of career ladders and merit pay.

With the exception of merit pay and career ladders, all of the approaches outlined above focus on removing, screening out, or providing better training to those whose ability and performance is most suspect. They constitute a 'bottom-up' strategy, to borrow a term from organizational theory. Most of the proposed changes are targeted at weeding out the very poorest teachers. They would have little impact on teachers whose ability or performance is judged to exceed the minimum threshold. From this perspective, the dominant approaches to teacher reform might be termed strategies for reducing mediocrity rather than for achieving excellence. Proposals for merit pay and career ladders, on the other hand, operate from a different perspective. They seek to reward the best teachers; hence they represent a "top down" approach.

This paper explores the appropriateness of "bottom-up" standard-setting strategies for improving teacher workforce quality. First, it examines the assumption that a problem exists with respect to the academic ability of teachers. The paper reviews three areas of educational research that, taken together, contribute to the widely shared notion that the intellectual or academic ability of teachers has a bearing on the performance of students. Research on demographic trends in teacher recruitment, teacher characteristics predicting student achievement, and effects of instructional practices, build a plausible case for policies designed to attract more academically able students to teaching careers.

As we shall see, while this research supports the goal of raising academic standards for teachers, it does not indicate what an appropriate level of academic proficiency might be, whether the payoff from bringing all teachers up to some higher minimum standard (the bottom up approach), exceeds benefits from efforts to retain the very brightest teachers, and the possible effects of related but somewhat different teacher selection criteria, such as subject matter knowledge, on student performance.

The second section of the paper examines issues related to the implementation and possible effects of different policy options. It examines the possible consequences of raising entry level requirements for teachers, upgrading teacher training, waiving certification requirements, and the cost of implementing various proposals. The potential impact of various proposals is considered in terms of their effect on the career preferences of college students, on teacher training institutions, and on the policies promulgated by state and local officials.

I. Teacher Characteristics and Student Achievement

Virtually all the major education reports and concommitant state policy enactments stress the need to improve the teacher workforce, principally by attracting more academically able teachers. Decline in the overall academic ability of teachers is thought to parallel, and in part, account for declining levels of student achievement. Hence, raising the intellectual ability of teachers is thought likely to result in higher levels of student performance. Over the past two decades, there have been hundreds of studies on the characteristics of teachers thought to be associated with student achievement.

This research was driven by a desire to identify those teacher traits that resulted in improved student performance, so that educators could alter their recruitment, selection, and training practices to maximize those qualities. This section of the paper examines research findings on: a) teacher characteristics and student achievement; b) effective teaching practices and effective schools; and c) demographic trends in teacher recruitment.

In order to identify predictors of student achievement, two basic lines of inquiry have been pursued. The first approach attempts to relate a wide variety of measurable school inputs -- expenditures, class size, student body and community characteristics, types of school facilities and characteristics of the faculty -- to various measures of student performance. This approach to the study of student achievement is called input/output, production function, or multivariate analysis. The second body of research on the determinants of student achievement relies less heavily on quantitative measures of school inputs, focusing instead on the observation of events that actually occur in schools and classrooms. These studies construct qualitative measures of school organization, role and authority structure, instruction practices and school policies. Research of this type is now popularly known as "effective schools" and "effective teaching" research.

Both the input/output approach and effective schools/teaching approaches reflected the time period during which each achieved popularity. Input/output studies reached prominence in education during the mid 1960s and early 70s, coinciding with many Great Society initiatives. The research reflected an assumption that educational maladies could be ameliorated by changes in resources spent on schools, and in the allocation of those resources. In a time of comparatively few restraints on government expenditures for education, this research focused on school inputs that seemed most easily altered, regardless of cost.

Effective schools research and the parallel studies of teacher effectiveness gained popularity during the late 1970s. Increasingly, they have captured the attention of policymakers and educators. Schools, districts and states have begun to implement the precepts of effective teaching, and legislation has been introduced in Congress to assist school improvement. Research on effective schools filled two important needs during the late 70s and early 80s. First, it reasserted the belief that schools and teachers make a difference in student outcomes, providing a defense against critics who claimed that schools simply perpetuate inherited student differences in wealth and race. Second, the research suggested rules for school improvement. This prescription for increased student achievement found support among practicing educators, and equally important, did not appear costly to implement.

Before examining the research on "what makes an effective teacher," it should be noted that methodological approaches differ, even among proponents of either effective schools or input/output types of research. Some studies compare performance of students at a single point in time, and others focus on gains in student achievement over time. Some studies aggregate test scores and faculty characteristics for a school as a whole, and others treat the individual classroom as the primary unit of analysis. One conclusion that emerges from the present review, however, is that multivariates or qualitative studies using small units of analysis, though more scientifically elegant, do

not necessarily produce new or more robust conclusions than studies that make no attempt to control for within-school variance in achievement or resources. In addition, the paper relies in part on secondary sources. There have been many excellent reviews of research determinants of student achievement and effective schools. This paper presents conclusions drawn from those reviews, in addition to findings from primary sources.

A. Determinants of Student Achievement

The best known, and perhaps most significant study of student achievement was the 1966 Coleman Report, Equality of Educational Opportunity. Coleman and his colleagues investigated a wide range of possible factors affecting student achievement across several grade levels. The study employed a national sample of almost 660,000 students in over 3900 schools. The central finding was:

> Taking all these results together, one implication stands out above all: that schools bring little influence to bear upon a child's achievement that is independent of his background and general social context, and that this very lack of independent effect means that the inequalities imposed upon children by their home, neighborhood and peer environment are carried along to become the inequalities with which they confront adult life at the end of schools. (Coleman, 1966)

Educators and researchers were quick to react to the popularization of Coleman's conclusion: schools don't matter. Many argued that Coleman's study examined the wrong variables, measured them incorrectly, employed improper statistical methods and, consequently, underestimated the real effects of schools on student achievement. Reanalyses of the Coleman data were conducted. Generally, they supported his central conclusion that home and community factors played a larger role in student achievement than school related factors measured in the study.

After Coleman, investigators began to frame their research issues in somewhat different terms. Instead of asking about all the factors that predict student achievement, they focused more closely on disaggregating data and on those school and teacher characteristics that might be related to student performance. Murnane reviewed several studies of school effectiveness and concluded that "there are significant differences in the amount of learning taking place in different classrooms within the same schools, even among inner city schools, and even after taking into account the skills and backgrounds that children bring to the school." (Murnane, 1980) Guthrie examined 19 studies; in 15 studies he found some teacher characteristic positively associated with student achievement, but no single teacher trait was consistently related to performance. (Guthrie, 1970) Other studies by Hanushek and by Summers have produced similar results. (Hanushek, 1979) As evidence accumulated that "teachers matter," researchers began to sort out those characteristics of teachers which were most important.

A broad range of teacher characteristics had been included in the Coleman Report. The investigators had collected information about age, sex, race, socio-economic background, education, teaching experience, certification, salary and professional activity. The study also attempted to measure the

quality of the institution where the teacher received his or her training, the teacher's job satisfaction and attitudes toward minority groups. None of these factors were found to be statistically significant predictors of student achievement.

The Coleman study found that the most significant school related factor predicting student achievement was a teacher characteristic -- the teachers' score on a test of verbal ability. (Coleman, 1966) Teachers in the survey were administered a 30 question vocabulary test. After controlling for socio-economic background and other student factors also related to achievement, Coleman and his colleagues found that achievement was related directly to the verbal ability of teachers. Moreover, teachers' verbal ability had a cumulative effect. In other words, the older the student (the more teachers the student had experienced) the more teacher ability mattered. Although verbal ability was related to the performance of all students, it was a particularly important factor in explaining the achievement of black students.

What does this finding mean? Does it indicate that teachers' verbal ability, as measured by a simple vocabulary test, causes students to perform in a particular manner? If so, teachers could receive "crash courses" to improve their word skills, with the expectation that student achievement would improve as a result. There are no experts who believe that student learning would benefit in this manner. The predominant interpretation of this key finding is that verbal ability is a crude measure of general intellectual ability. According to James Guthrie, "If the measure of verbal ability is taken to represent the general intelligence level of the teacher, the finding can be construed to mean that an intellectually facile instructor is more adept at tasks such as finding means to motivate students, adapting material to their ability levels, and communicating in ways which make the subject matter more understandable." (Guthrie, 1970)

Research following the Coleman Report produced mixed findings on the connection between teachers' verbal ability (or intelligence), and student achievement. Hanushek reviewed 15 studies that included measures of teacher verbal ability and student performance. In fourteen of the fifteen studies, teacher verbal ability showed a positive relationship to student performance on standardized test measures. But this finding was statistically significant in only one third of the studies. Hanushek concluded "...the only reasonably consistent finding seems to be that 'smarter' teachers do better in terms of student achievement." (Hanushek, 1980)

Other investigators have also looked at a wide range of teacher characteristics. Summers found no significant relationship between reading performance of fourth grade students and such characteristics as the teachers' score on the National Teachers Examination, the quality of his or her undergraduate school, advanced training courses, or years of classroom teaching experience. (Summers, 1979) She did find that students with teachers who were frequently absent or with teachers who were teaching in that grade for the first time did distinctly worse on reading performance. But of 112 studies that Murnane reviewed, a significant positive relationship between amount of teacher experience and student performance was evident in only 30 percent. His conclusion: "no set of observable characteristics provides a reliable composite picture of the effective teacher." (Murnane, 1980)

In summary, almost every input-output study of student performance shows some characteristic of teachers related to student performance. No clear or consistent pattern of findings has emerged, however, from this body of research. Most of the characteristics thought to be important such as job experience, undergraduate grades or amount of advanced training, are not borne out as important by the research. The one teacher characteristic most strongly related to student performance is the general intelligence level of the teacher. Unfortunately, there are relatively few studies of this trait (compared to studies of education and income), and most, like the Coleman study, use crude proxies of intelligence. Another limitation is that the research does not indicate what range of teacher abilities was represented in the samples. In other words, where teachers' intellectual ability is related to student achievement, are most effects attributable to teachers of particularly low, average, or high intelligence? Knowing the answer might make it possible to select most carefully in the critical part of the ability range. As it stands, it would be difficult to argue that this research justifies major policy initiatives to alter the intellectual mix of the teacher workforce.

Input-output or production function studies are limited by their ability to measure only the quantifiable characteristics that teachers bring to the classroom. They are unable to consider how effectively particular resources are actually used, and the kinds of behavior affecting learning that actually occurs in the classroom. From studies of implementation, we know that teachers use resources in a wide variety of ways, adopting programs and other resources to individual circumstances. (McLaughlin and March, 1978) One response to this limitation has been to undertake more qualitative studies of the different ways in which schools actually deploy personnel and other resources.

B. Effective Schools/Effective Teaching

In contrast to studies of the determinants of achievement, studies of effective schools and teaching have concentrated on the ways in which schools are organized, their personnel make decisions and use time for instructional purposes, and on the process by which changes occur. These studies attempt to account for differences in student learning through such factors as differences in school organization, leadership, teacher practices and expectations, school goals and atmosphere. The findings from these studies provide a generally consistent pattern. "Most schools with effective programs are characterized by high staff expectations and morale; a considerable degree of control by the staff over instructional and training decisions in the school; clear leadership from the principal or other instructional figure, specified goals for learning, and by a sense of order in the school." (Purkey and Smith, 1982)

Focusing more closely on teachers, Cohen's review of effective schools research suggests three characteristics that are particularly important to teacher effectiveness. (Cohen, 1983) First, effective teachers are those that "have a high sense of efficacy -- they believe that they are effective and can affect the learning of students." Such teachers create an orderly businesslike classroom environment. They provide clear instruction to students, closely supervise student performance and hold students accountable for their work. Second, effective teachers structure classroom activity in order to spend maximum time on academic tasks and reduce time spent on other pursuits. Finally, effective teachers engage in active, direct instruction of students.

Other reviews of effective teaching research yields similar themes. Brophy argues that there are eight characteristics of effective teachers closely associated with gains in student learning. (Brophy, 1982) These include high teacher expectations, use of time for learning activities, active teacher involvement in instructional activities, and high standards of expected student performance. Fullan notes, "there is one teacher trait related to successful implementation and student learning which comes through strongly: teacher sense of efficacy." (Fullan, 1982) Efficacy is a belief on the part of the teacher that he or she can help even difficult students to learn. Rosenshine finds that direct instructional activities emphasizing academic skills are most conducive to student learning. (Rosenshine, 1982)

While research on effective schools has produced a fairly consistent set of findings, it is less clear how these qualities can be encouraged for teachers who lack them. What is the source of teacher "efficacy?" Why do some teachers employ more effective management practices than others? Can any of these characteristics be maximized through different selection or retention policies?

Brophy suggests that "effective teachers -- teachers who do all the things mentioned above -- are not "ordinary" teachers. They are probably brighter and more dedicated than average."(emphasis added) (Brophy, 1982) It seems plausible that teachers with high expectations for the performance of students are the ones who, as students, set high standards for themselves. Without faculty commitment it would be impossible for a school to develop consensus around the value of academic goals. Because schools are loosely organized institutions it is probably difficult to impose high standards, expectations, or behavioral requirements upon teachers. Leadership and school policies can reinforce traits related to effective teaching, but some of the most important characteristics may be ones that teachers bring to the job. While this interpretation is speculative, it implies that the probability of altering schools to make them more effective depends, as Brophy suggests, on the academic ability and commitment of those who become teachers.

Two modest conclusions may be drawn from this review of input-output studies of educational achievement and studies of effective schools. First, the intellectual ability of the teacher emerges more often than any other single teacher-related factor as a predictor of student achievement. Other factors, such as years of experience, advanced training, and salary do not seem particularly related to student achievement. Second, while research on effective schools does not directly say anything about teacher recruitment and preparation, one may infer that intellectually able teachers are somewhat more likely to embrace effective teaching practices (that emphasize academic achievement) than those whose academic ability is itself suspect. The following section of this paper considers actual trends in teacher recruitment and the academic ability of the teacher workforce.

C. Demographic Trends in Teacher Recruitment

Until recently we knew very little about the academic characteristics of those who entered teaching. (Schalock, 1979) Since the late 1970s, however, several studies have examined the academic ability of teachers and prospective teachers. This research strongly suggests that during the past fifteen years

there has been a notable decline in the academic ability of those who enter teacher training programs, graduate, are certified, and become teachers. Indeed, decline in the academic ability of undergraduate education majors, during this period, has been even greater than for the college population as a whole.

Weaver examined the SAT scores of those college students majoring in education and those who eventually obtained teaching positions. (Weaver, 1979) He compared verbal and math scores of education majors with the test scores of students in other academic majors. During the period from 1970-1976, Weaver found that:

- SAT scores for high school students who intend to major in education were consistently lower than the average scores of college bound high school seniors. In 1976, SAT verbal scores for prospective education majors were 34 points below the national average in verbal aptitude, and 43 points below average in math. Scores of prospective education majors averaged lower than did the scores of prospective enrollees in the six other largest college majors.

- Education majors who graduated from college in 1976 scored substantially lower on verbal and math SAT tests than did other college seniors. On the SAT verbal, education majors ranked lower than 14 out of 16 fields of study (office-clerical and vocational-technical majors ranked lower); in math, education majors ranked lower than 15 out of 16 fields (office-clerical majors had lower average SAT scores).

- Education majors who obtained teaching jobs had significantly lower verbal and math test scores than those education majors who did not become teachers. Apparently, those education majors who are most academically able are least likely to become teachers.

- Between 1969-1975, the average score on the National Teacher Examination dropped 20 points.

Vance and Schlechty conducted a similar study of teacher recruitment, focusing on trends during the second half of the 1970s. (Vance and Schlechty, 1982) They examined the academic abilities of those who entered teaching and remained, as well as those who left after several years. Their study complements Weaver's in two ways. First, it extends the data base to include the period from 1976-1979. Second, it examines the issue of teacher retention. If teacher training institutions and those who make initial hiring decisions are not particularly selective, perhaps teachers are sorted out during the first few years on the job. Like Weaver, Vance and Schlechty found that "teaching is more attractive to individuals with low measured academic ability than to those with high measured academic ability." Of equal if not greater significance, they found that schools fail to retain their most academically able teachers. Those with the lowest SAT scores are most likely to remain in teaching, while a disproportionately large number of those with higher SAT scores leave the profession (or state that they intend to do so).

Since prospective employers rarely have access to SAT scores; perhaps

their hiring decisions reflect use of other indices of academic ability. To consider this possibility, Perry examined the academic credentials of 1980 teacher training graduates from North Texas University. She compared those who obtained jobs with those who were unable to secure teaching jobs. Perry found no significant differences between these two groups on such variables as grade point average, student teaching evaluation and professional recommendations. (Perry, 1981)

This research indicates that teacher training institutions attract among the least academically able students, that the graduates of teacher education schools do not perform as well on standardized tests as do other college graduates, and that these differences are eventually reflected in the academic qualifications of those who become teachers. School systems retain an inordinate percentage of their least academically qualified teachers and lose a particularly high percentage of those with the best scores on standardized achievement tests.

In conjunction with a teacher surplus, these dismal results have encouraged state and local officials to seek ways of raising standards for admission to teacher education programs and of making graduation requirements more demanding. Such policies will do little, however, to stem the loss of academically qualified education majors who do not become teachers, or who leave teaching after a few years. Although the average academic ability of new teachers certainly declined during the 1970s, it is uncertain whether the decline occurred because of a failure to attract very bright students, or from an infusion of students with limited academic proficiency. To some extent, policies to reverse this trend reflect the assumption that the brightest students altered their career choices during the past decade but it may be the case that the overall pool of candidates also underwent change.

Another point worth noting is the apparent reluctance of school districts to raise their hiring standards during the 1970s when labor market conditions -- low demand for teachers -- suggested that they could have done so. There are two possible explanations. First, raising recruitment standards would have made it more difficult to hire minority group members. Second, low standards helped preserve the surplus of teachers relative to demand. This surplus restrained the need to increase teacher salaries. Indeed, during the 1970s, average teacher salaries fell further behind inflation than did wage increases for the workforce as a whole. This experience suggests that any new policy to raise the academic standards of the teaching workforce will quickly collide with other fundamental manpower objectives. The following section considers some of these possible policies in greater detail.

II. Policy Alternatives

Efforts to raise the standard of new teacher candidates occur within a framework of broad manpower policies and practices. Teacher recruitment policies reflect several basic, and potentially competing objectives. School systems attempt to recruit sufficient numbers of teachers to meet their projected staffing requirements. The demand for teachers is primarily a product of demographic trends -- the size of the school age population and its distribution across different regions of the country. Demand is also affected by the teacher-pupil ratios that school districts consider desirable, and by

the need to replace teachers who leave -- through resignation, retirement, death or termination.

During the 1970s, declines in student enrollment were partially offset by increased demand for special education and bilingual education teachers, and by efforts to reduce average class size. Not until the end of the decade did reduced enrollment lead to overall reductions in the number of classroom teachers employed. From 1977 to 1982, approximately 100,000 teaching positions were eliminated, although the pattern varied considerably by region of the country. Experts predict that the demand for teachers will increase during the second half of the 1980s.

Like any employer that regards itself as selective, school systems prefer to employ the best qualified personnel available. They set minimum employment standards which may include graduation from an accredited teacher training program, state-level teaching certification, satisfactory completion of a pre-service internship, and (in some cases) the ability to pass a competency test in basic skills, knowledge of subject matter, or pedagogical principles. These requirements vary considerably from state to state, as does the level of proficiency demanded of those taking minimum competency tests. Once employed, most school districts provide salary increases for those who obtain additional professional training and for years of teaching experience. This policy reflects a belief, unsubstantiated in this literature review, that experience and advanced training contribute to teaching effectiveness.

In addition to balancing quality and quantity, equity considerations play a crucial role. School systems have responded to criticism that minorities have been underrepresented among the teaching workforce. In addition, schools are typically the largest single source of employment by local government meaning that they are likely places to rectify perceived inequities in public sector employment.

Schools compete with other employers for the most competent personnel. Low salaries, few jobs, poor working conditions and the growth of job opportunities outside of teaching for women and minorities have made teaching a relatively less attractive career than in the past. Employment opportunities in teaching are expected to increase, however, in the next decade. By one estimate, there will be 19 percent more elementary school teachers employed in 1992 than in 1982. (National Center for Education Statistics, 1984) When coupled with turnover among school personnel, new hires may constitute as much as 30 to 40 percent of the present workforce (somewhat more in elementary schools, and somewhat less in secondary schools). This change in personnel offers a substantial opportunity to reshape the skills and abilities of classroom teachers.

These are some of the broad manpower objectives that shape the education workforce. Policy initiatives to increase teacher quality occur within the context of these fundamental objectives. Those include raising entry requirements, raising salaries, waiving certification requirements, and terminating incompetent teachers. Each option is explored below.

A. Raising Entry Level Requirements

Raising entry level requirements entails one or more of the following: more demanding requirements for admission to teacher training institutions, stiffer graduation requirements from such institutions, or more widespread use of competency tests to screen out those lacking adequate basic skills, knowledge of subject matter or pedagogy. The burden of implementing tougher admissions and graduation standards falls upon schools of education, while competency tests are the responsibility of states and school districts. To the extent that training institutions and employers have different organizational needs, the effects of policy initiatives upon each should be considered separately.

In general, schools of education are unlikely to raise standards voluntarily in the face of declining enrollment. While some, particularly more elite institutions, may do so, these institutions are not where the problem lies. Those marginal institutions struggling to recruit students even now, are unlikely to voluntarily inflict further loss of revenue upon themselves.

Another option is for accrediting institutions to impose across the board standards, either for admission or for the performance capabilities of graduates. National accrediting bodies currently affect only a fraction of all teacher training institutions and have very limited authority to impose standards of any sort. They employ accreditation standards that focus primarily on school inputs -- course offerings, faculty qualifications, library resources and internal college organization. Schools that recruit high-risk students, seek a heterogenious student population, or are located in areas where elementary and secondary school preparation is weak would be most adversely affected by higher standards. Somewhat more palatable is the option of maintaining relaxed admission requirements while tightening graduation standards. This approach would reduce possible revenue losses somewhat while providing high risk applicants with access to teacher training opportunities. At the same time, schools of education could upgrade their remedial training efforts so that students could satisfy the stiffer graduation standards.

At least as thorny as the implementation of tighter admissions standards would be the effects of more restrictive hiring policies through competency testing on states and school districts. One obvious effect is that there will be fewer job candidates able to satisfy the requirements for teaching positions. If standards are raised significantly, it could actually result in a teacher shortage. Raising standards is a normal strategy in a buyer's market. When the supply of job candidates exceeds the number of positions available, recruiters can be more selective, while still filling all their vacant positions. The movement to raise standards for teachers migh have been an entirely predictable response to the teacher surplus of the 1970s. Today, however, the policy may run counter to labor market trends.

The teacher surplus has largely been corrected. From 1970-1982, the proportion of college freshmen indicating elementary or secondary education as a probably career option fell from 19.3 percent to 4.7 percent. (National Center for Education Statistics, 1984) During this period, the number of education majors, as a percentage of all bachelor's degree recipients, dropped from 34 percent to 15 percent. At present, schools of education graduate enough students to satisfy demand (despite the shortage in math and science).

This equilibrium is likely to be replaced by a shortage of teachers. Between 1988 and 1992, the need for new teachers is projected to average approximately 185,000 per year, an increase of 43 percent over the most recent five year period. As demand increases in the 1990s, schools of education may have difficulty producing a sufficient number of new teachers. By one projection, should the number of graduates from teacher training institutions continue to decline, "then the supply of new teacher graduates could equal less than 60 percent of the projected demand for additional teachers between 1988 and 1992." (National Center for Education Statistics, 1984)

Raising standards will exacerbate already existing teacher shortages in particular fields -- notably math and science. In addition, it is likely to create new shortages, especially in fields that grew most rapidly during the 1970s. Despite the difficulty of working with handicapped children, special education attracted many teachers during the 1970s. In coming years, many new teachers will be able to find employment in less demanding specialties. Finally, there are certain non-academic teaching specialties for which more restrictive entry requirements would seem almost irrelevant. Such fields as physical education, home economics, vocational and industrial education would not appear to profit directly from admissions standards that screen job applicants on academic criteria.

In summary, major increases in the standards required of prospective teachers are contemplated precisely as the demand for teachers is projected to rise. This will: a) make higher standards more difficult to sustain, and b) increase the leverage that teacher unions have in securing attractive wage settlements through collective bargaining.

B. Raising Teacher Salaries

Proposals to increase teacher salaries are desinged to make the profession more attractive to bright college students. With expanded labor market opportunities for women, minorities and technically trained individuals, everyone recognizes that salaries must increase if schools are not to fall further behind in attracting high quality personnel. Several factors likely to affect the feasibility of any salary increase, however, are: a) its total cost, b) the response of bright college students, and c) the type of salary increase provided -- across the board or targeted. Each of these issues is considered below.

1. Costs

In 1980, the average starting salary for teachers was $11,758; the average salary for all full time employees in the United States was $15,094, while those with college degrees earned considerably more. (Guthrie and Zusman, 1982) Between 1970-1982, the purchasing power of the average teacher salary declined 13 percent. In comparison, the real wages of all full-time workers fell by just 6 per cent. Simply to restore the average teacher salary to its 1970 purchasing power would require an additional annual expenditure of nearly $6 billion. To meet the upward pressure on salaries caused a projected increase in demand for teachers and declining enrollments in teacher education, could very well require additional annual expenditures exceeding $6 billion.

Some states and school systems may have the resources to raise teacher salaries. Many others will have to levy new taxes. Some states, such as Texas, have already done so. Since salary increases for one group of public sector employees usually generate similar demands from other employees, the result could be a substantial upward spiral in government spending.

2. Response to Salary Increase

It is difficult to estimate how effective a salary increase will be in drawing brighter talent into the field. Policymakers should have reasonably limited expectations, however, for the response to any salary increase. The academic skills of those who enter teaching have historically been lower than those in other fields. Studies completed during the 1940s, 1950s, and even into the early 1960s showed that students preparing to become teachers were less able academically than students preparing to enter other professions. (Sykes, ND) The academic standing of education majors declined further during the 1970s. Given this historical pattern, it is unlikely that modest financial incentives will improve the rank order of education students relative to those in other college majors. A more reasonable expectation is that financial rewards can help arrest the continued deterioration in the average academic skills of those entering the teaching profession, which is worthwhile in itself but may not improve the overall academic skills of the teacher workforce.

Of the many ways in which policymakers might attempt to attract brighter job candidates, salary increases are particularly important at this point in time. The years since 1970 have been the most dismal period in the past 50 years for teacher salaries relative to those for the workforce as a whole. In each of the three decades preceding 1970, the rate of teacher salary increases outpaced those for the average full time worker. (National Center for Education Statistics, 1984) Since 1970, teacher salaries have lost ground to inflation and failed to keep pace with salary growth in the rest of the workforce. While those who became teachers before 1970 did not expect to earn a high income, they had reason to expect salary increases that kept pace with salaries throughout the workforce. Since 1970, such increases have ceased. Salary increases sufficient to reverse this trend and reestablish teacher parity with the workforce could produce a favorable response.

Two other factors make salary increases for teachers opportune. One factor has been a change in the motivation of those who aspire to become teachers. Several analyses indicate that job security, once a major reason for entering teaching, is no longer as important a consideration. (Robertson, Keith and Page, 1983) No doubt this change reflects the depressed job market for teachers in the past 10 years. Previous generations of teachers traded high salaries in favor of job security (a trade-off similar to ones under negotiation in many smokestack industries). Since the assuredness of continuous employment no longer attracts many, it seems plausible that the relative importance of salary is greater, and that increases could bouy the attractiveness of the profession.

Another important change has been the labor market position of women. Historically, women willingly accepted low teaching salaries because of the lack of other professional employment opportunities, and the advantages teaching offered women with children. As more lucrative job opportunities

opened up and made possible other child care arrangements, the tradeoff of low-paid teaching looked less attractive. Such women might respond favorably to a salary increase.

Factors other than salaries also weigh upon the career decisions of perspective teachers. Several studies have found that prospective teachers are heavily influenced by their former teachers. (Robertson, Keith and Page, 1983) Some teachers may directly counsel students about educational and occupational plans. More likely, however, many students are drawn to teaching by observing their own teachers. When those teachers seem to enjoy work and exhibit high morale, it makes the profession more attractive to future generations. When teachers labor under adverse conditions, or when there is high turnover, the message is not lost on students.

To summarize, salary increases are important and particularly opportune. An attainable objective is to stem the recent decline in salaries and the academic ability of prospective teachers. By themselves, however, modest salary increases will probably not be sufficient to attract enough bright job applicants and alter the rank of teaching relative to other professions. The status and working conditions of teachers have deteriorated in too many ways. Over the long run, these other factors may be more difficult to alter and improve than teacher salaries.

3. Targeting Salary Increases

Most salary proposals call for across-the-board increases in teacher salaries. In such proposals, all teachers would benefit by a proportionately equal amount. This is a reasonable approach if all teachers are equally deserving. It also avoids the politically difficult task of specifying criteria by which some teachers benefit and others do not. Finally, across the board salary increases may serve as the quid pro quo for teacher union acceptance of more objectionable reform measures.

While raising the general level of teacher salaries will make the profession somewhat more attractive, there may be more effective ways to target these limited financial resources. These alternatives are analagous to the rewards utilized in military recruitment. They might include a) one-time bonuses for those who score particularly well on the National Teacher Examination, Scholastic Aptitude Tests or some other test of academic ability or subject matter knowledge; b) grants, scholarships or loan forgiveness to attract talented education majors; c) proportionately higher salary increases for starting teachers or teachers with a particular number of years of satisfactory performance; or d) a "reenlistment" bonus for completion of an exemplary one or two year teaching internship. There are issues to consider in implementing each of these suggestions. The basic point, however, is that in addition to or in lieu of general salary increases, targeted expenditures may be required to bring brighter students into the teaching field.

C. Waiving Certification Requirements

Several states are considering and New Jersey has enacted policies which to waive the requirement that prospective teachers possess college majors in education. In some cases the intent is to attract those with expertise in

needed subject areas, while in others the intent is to attract more academically able prospects. This change will provide a new route into teaching outside the established schools of education. In New Jersey, for example, the Commissioner of Education has proposed that "school districts will be able to hire, on a provisional basis, anyone who holds a Bachelor's degree and who has passed the state test in the subject which he or she will teach. However, during the first year the district must provide new teachers with the direction, supervision, support and on-the-job training which will enable them to succeed and which will enable district professionals, under state supervision, to determine the candidates' teaching ability and eligibility for a standard license." (Coperman, 1983) California has had a policy of a BA plus a fifth year in education courses and training for many years.

Proposals to relax certification requirements take many different forms. Some options would open employment to candidates with bachelors' degress who are able to pass a test of subject matter knowledge. Others would provide on-the-job training in pedagogic techniques. Still other proposals would provide temporary certification to B.A.s without education backgrounds, pending completion of education course requirements. Many jurisdictions already have provisions permitting temporary employment of non-certificated personnel when persons with certificates are not available. Some of the new proposals would, however, permit school districts to hire those lacking education course requirements in preference to certificated teachers.

Waiving teacher certification requirements is attractive because it helps to solve certain short-term problems, notably teacher shortages in math and science. In addition, it opens the profession to a wider pool of talent than is now permitted. School systems may hire graduate students with expertise in needed areas, or borrow experts from industry to teach particular courses. These are appealing staffing alternatives.

The proposals also carry the potential for several less desirable effects. First, waiving certification requirements will make it even more difficult for teacher training institutions to attract well-qualified applicants. Many college students who might have chosen to major in education will select other specialties, knowing, they can become teachers at a later date, if they so desire. Eventually, this policy could increase the cost of hiring teachers, if it drives some college students to major in fields other than education. Bringing them back may require salaries that meet the market rate for people with their skills and credentials. On the other hand, the applicant pool may offset the need for higher salaries.

Second, relaxation of certification requirements could contribute to teacher turnover. Individuals could move in and out of teaching with relative ease, becoming teachers when private labor market conditions were unfavorable, and leaving as soon as employment improved. Since teaching is widely perceived as "something to fall back on," opening the routes into teaching would only strengthen this option. While some support this idea wholeheartedly, others are skeptical of teachers flowing in and out.

Finally, this proposal could have adverse implications for other school improvement strategies. Various studies of effective schools report that successful schools are ones characterized by a shared sense of purpose, a

"moral order," and a common commitment to fundamental educational values. Cohen has written that "effective schools generate a strong sense of community, with commonly shared goals and high expectations for student and staff performance and mechanisms for sustaining motivation, commitment and identification with school goals." (Cohen, 1983) In other professions, the development of shared values and common goals is reinforced by the academic training students receive. Training in education may not produce quite the same results as in law and medicine, but it does result in four years of exposure to basic principles of education and pedagogy. Proposals to waive certification requirements could result in faculties with persons of widely different academic backgrounds and orientations to teaching. If so, the conditions necessary to achieve a sense of community and common purpose will be made more difficult. Lack of "community" may be one price that schools pay for opening employment to bright candidates with little training in or commitment to education.

D. Removing Unqualified or Incompetent Teachers

Several recommendations have been made for ways of removing incompetent teachers. These proposals deal with teachers who are currenly employed and have tenure. Traditionally, efforts to fire tenured teachers on grounds of poor performances have proven exceedingly difficult to carry out. To make termination easier, proposals have been suggested to require periodic recertification of teachers, or to test current teachers for basic competency. Such proposals meet with strong opposition from teacher unions which regard them as "changing the rules of the game" after a teacher has been hired. Such proposals also involve costs: for evaluation, for testing, and for providing extensive remediation. These additional expenditures provide no assurance that the termination will eventually succeed or the teacher will improve. And even if the teacher does improve, he or she may be barely competent, at best. In contrast, the same expenditures might be employed, more successfully, as inducements to recruit academically capable new teachers.

Proposals for additional testing of already certified personnel are among the most controversial and may be too "hot" for many jurisdictions. In some cases, it may be better for a state or school district not to attempt to discover how many teachers cannot pass a basic competency test. One can imagine the public outcry when the figures are released. One can even anticipate lawsuits for failure to provide a "thorough and efficient" education.

Conclusion

The goal of this paper has been to help policymakers better anticipate the consequences -- pro and con, direct and indirect -- of pursuing policy options designed to improve the teacher workforce. This portion of the paper begins with a review of the basic assumption that the academic ability of teachers has declined, and that decline has affected student performance adversely. Scattered evidence from several major bodies of research supports the general thrust of efforts to attract more academically capable teachers. It is unclear however, whether efforts focused on screening out the least able job candidates are preferable to those designed to attract top-level performers. This distinction is important, for many policies that might accomplish the

first objective would have no bearing on teachers who exceed minimum performance thresholds (except to compete for scarce resources).

There are a variety of different ways considered for raising the academic proficiency of teachers. Some alternatives focus on teacher training, while others deal with employment. Many of these recommendations were advanced in recent national reports. Some reports suggested that they be adopted as a total package. In the euphoria following the initial reports, some argued that it would be a mistake to adopt recommendations on a piecemeal basis. The national reports were conspicuously silent, however, about the dollars necessary to implement their recommendations, the relationship between recommendations and other fundamental manpower objectives, and the interplay among various recommendations. As this reality sets in, as legislative packages are actually drafted, as voters and legislators are asked to approve tax increases, and as educational "sacred cows" are threatened, some proposals will inevitably prove more attractive than others.

BIBLIOGRAPHY

Airasian, Peter W. and George F. Madaus. "Linking Testing and Instruction: Policy Issues." Journal of Educational Measurement, Vol. 20, No. 2 (Summer 1983).

Airasian, Peter W., Madaus George F. and Pedulla, J.J. Minimal Competency Testing. Educational Technology Publictions, 1979.

Alexander, K.L. and Pallas, A.M. "Curriculum Reform and School Performance: An Evaluation of the New Basics." Center for Social Organization of Schools: The Johns Hopkins University, 1983.

Anderson, Lorin W. Assessing Affective Characteristics in the Schools. Boston: Allyn and Bacon, 1981.

Barro, Stephen. "The Incidence of Dropping Out: A Descriptive Analysis." NCES Draft Report. October 1984.

Beggs, Donald L. and Ernest L. Lewis. Measurement and Evaluation in the Schools. Boston: Houghton Mufflin, 1975.

Bertrand, Arthur and Joseph P. Cebula. Test, Measurement, and Evaluation: A Developmental Approach. Reading, MA: Addison-Wesley Publishing Co., 1980.

Blood, Don F. and William C. Budd. Educational Measurement and Evaluation New York: Harper and Row, 1972.

Bloom, Benjamin S., George F. Madaus, and J. Thomas Hastings. Evaluation to Improve Learning, New York: McGraw-Hill, 1981.

Brophy, Jere. "Successful Teching Strategies for the Inner City Child," Phi Delta Kappan. April 1982, pp. 527-529.

Brown, R. Education Advisory 1985. Education Commission of the States, 1984.

Burke, Fred E. "Testing and Funding: The New Jersey Experience." In "Measurement and Educational Policy." Schrader, William B. ed. New Directions for Testing and Measurement No. 1, 1979. San Francisco, CA: Jossey-Bass, 1979.

Burns, Edward. The Development, Use and Abuse of Educational Tests. Springfield, IL: Charles C. Thomas Publishing, 1979.

Burton, Nancy W. "Societal Standards." Journal of Educational Measurement, Vol. 15, No. 4 (Winter, 1978), pp. 263-271.

Carnegie Foundation for Advancement of Teaching. "High School: A Report on American Secondary Education." Harper and Row, 1983.

Cohen, Michael. "Effective Schools: Accumulating Research Findings." American Education. Vol. 18, No. 1, pp. 13-16, 1982.

Cohen, Michael. "Instructional, Management, and Social Conditions in Effective Schools," in School Finance and School Improvement: Linkages for the 1980s. Allan Oddin and L. Dean Webb, eds. Ballinger Publishing, Cambridge, MA: 1983, p. 22.

Coleman, James S. and Nancy L. Karweit. Measures of School Performance. Santa Monica, CA: Rand, 1970.

Coleman, James S., et.al. "Equality of Educational Opportunity." Washington, DC: U.S. Government Printing Office, 1966, p. 325.

Coperman, Saul. "An Alternative Route to Teacher Selection and Professional Quality Assurance: An Analysis of Initial Certification," New Jersey State Department of Education, 1983.

Darling-Hammond, L. and Wise, A.E. "Beyond Standardization: State Standards and School Improvement." The Elementary School Journal, Vol. 85, No. 3, 1985.

Ebel, Robert L. Essentials of Educational Measurement. Englewood Cliffs, NJ: Prentice Hall, 1972.

Education Week. "Changing Course: A 50-State Survey of Reform Measures." February 6, 1985.

Elmore, R. and McLaughlin, M.W. "Steady Work: The Task of Educational Reform." NIE, 1984.

"Florida Raises Basic Skills Test Cutoff." Education Today Newsline, 1/20/84.

Fullan, Michael. "Implementing Educational Change: Progress At Last," (prepared for National Institute of Education), February 1982, p. 28.

Gardner, John W. "Excellence. Can We Be Equal and Excellent Too?" New York: Harper and Row, 1961.

Glaser, R. "Instructional Technology and the Measurement of Learning Outcomes." American Technologist, 1963, 18, pp. 519-521.

Glass, Gene V. "Standards and Criteria." Journal of Educational Measurement, Vol. 15, No. 4 (Winter 1978), pp. 237-261.

Goslin, David A. Teachers and Testing. New York: Russel' Sage, 1977.

Guthrie, James. "A Survey of School Effectiveness Studies." in Do Teachers Make a Difference, U.S. Department of Health, Education and Welfare. OE-58042, p. 45, 1970.

Guthrie, James and Zusman, Ami. "Teacher Supply and Demand in Mathematics and Science," in Phi Delta Kappan, September 1982. Figures for all full time employees from Digest of Education Statistics, 1983-84, National Center for Education Statistics.

Hambleton, Ronald K. "On the Use of Cut-off Scores With Criterion-Referenced Tests in Instructional Settings." Journal of Educational Measurement, Vol. 15, No. 4 (Winter 1978), pp. 277-290.

Hamilton, S.F. "Raising Standards and Reducing Dropout Rates: Implications of Research for Recent Secondary School Reform Proposals." Edited first draft. 1984.

Haney, Walt and Madaus, George. "Making Sense of Competency Testing Movement." Harvard Educational Review, Vol. 48 #4, November 1978, pp. 462-84.

Hanushek, Eric. "The Production of Education, Teacher Quality and Efficiency," in Do Teachers Make a Difference, pp. 95-96; Anita A. Sumners, "What Helps Fourth Grade Students Read?: A Pupil, Classroom-Program-Specific Investigation," Department of Research, Federal Reserve Bank of Philadelphia, 1979.

Hanushek, Eric. "Throwing Money At Schools." Discussion Paper No. 8004, University of Rochester, April 1980, p. 13.

Jaeger, Richard M. and Carol Kehr Tittle. Minimum Competency Achievement Testing: Motives, Models, Measures and Consequences. Berkeley, CA: McCutcheon Publishing Co., 1980.

Kellaghan, Thomas, George F. Madaus and Peter W. Airasian. The Effects of Standardized Testing. Boston: Kluwer Nijhoff Publishing, 1982.

Kirkland, Marjorie C. "The Effects of Tests on Students and Schools." Review of Educational Research, Vol. 41, No. 4 (October 1971), pp. 303-350.

Klitgaard, Robert E. Achievement Scores and Educational Objectives Santa Monica, CA: Rand, 1974.

Lazarus, Mitchell. Goodbye to Excellence: A Critical Look at Minimum Competency Testing. Boulder, CO: Westview Press, 1981.

LeMahieu, Paul G. "The Effects on Achievement and Instructional Content of a Program of Student Monitoring Through Frequent Testing." Educational Evaluation and Policy Analysis, Summer, Vol. 6, no. 2, 1984, pp. 175-87.

Lennon, Roger T. "Impactive Changes on Measurement." New Directions for Testing and Measurement, No. 3, 1979. San Francisco, Ca.: Jossey-Bass, 1979

Lerner, Barbara. "Tests and Standards Today: Attacks, Counterattacks, and Responses." New Directions for Testing and Measurement, No. 3, 1979.

Levin, H.M. "About Time for Educational Reform" in Educational Evaluation and Policy Analysis, Summer, Vol. 6, No. 2, 1984, pp. 151-163.

Linn, Robert L. "Testing and Instruction: Links and Distinctions." Journal of Educational Measurement, Vol. 20, No. 2 (Summer 1983), pp. 179-189.

Madaus, George F. "Testing and Funding: Measurement and Policy Issues." In "Measurement and Educational Policy." Schrader, William B. ed. New Directions for Testing and Measurement No. 1, 1979. San Francisco, CA: Jossey-Bass, 1979.

McDill, E.L., Natriello, G. and Pallas, A.M. "Raising Standards and Retaining Students: The Impact of the Reform Recommendations on Potential Dropouts." Edited first draft, 1984.

McLaughlin, Milbrey and Marsh, David. "Staff Development and School Change," Draft, March 1978.

Mehrens, William A. and Irvin J. Lehmann. Standardized Tests in Education. New York: Holt, Rinehart and Winston, 1975.

Murnane, Richard. "Interpreting the Evidence on School Effectiveness," Working Paper No. 830, Institution for Social and Policy Studies. Yale University, p. 3, 1980.

Nairn, Allan and Associates. The Reign of ETS: The Corporation That Makes Up Minds. Washington, DC: Ralph Nader, 1980.

National Academy of Sciences. "Improving Educational Achievement (The Wirtz Report)." New York University Education Quarterly, 1977.

National Association of Secondary School Principals. Competency Tests and Graduation Requirements. Reston, VA: NASSP, 1976.

National Center for Education Statistics. "Condition of Education, 1984 Edition."

National Center for Education Statistics. "Digest of Education Statistics, 1983-84."

National Center for Education Statistics. "High School and Beyond." 1980 Sophomore Cohort First Follow-up (1982) Data File User's Manual, April 1983.

National Commission on Excellence in Education. A Nation At Risk, U.S. Department of Education, 1983.

National Education Association. Measurement and Testing: An NEA Perspective. Washington, DC: NEA, 1980.

Ottobre, Frances M., Ed. Criteria for Awarding School Leaving Certificates. Oxford, Pergamon Press, 1979.

Perry, Nancy Cummings. "Teachers: Why Aren't the Best Hired," Phi Delta Kappan, October 1981, p. 113.

Peterson, Paul E. Making the Grade: Report of The 20th Century Task Force on Federal Elementary and Secondary Education Policy. New York: The 20th Centruy Fund, 1983.

Popham, W. James. "As Always, Provocative." Journal of Educational Measurement, Vol. 15, No. 4 (Winter 1978), pp. 297-300.

Popham, W. James and Rankin, Stuart C. "Minimum Competency Tests Spur Instructional Improvement." Phi Delta Kappan, May 1981, pp. 637-39.

Porter, Andrew C. "The Role of Testing in Effective Schools." American Education, January-February 1983, pp. 25-28.

Purkey, Stewart and Smith, Marshall. "Effective Schools -- A Review," University of Wisconsin, June 1982, p. 23.

Ravitch, Diane. The Troubled Crusade: American Education 1945-1980, New York, Basic Books, 1983, p. xii.

Resnick, Daniel P. "Testing in America: A Supportive Environment." Phi Delta Kappan. May 1981, pp. 625-28.

Resnick, Daniel P. and Lauren B. Resnick. "Standards, Curriculum, and Performance: A Historical and Comparative Perspective." Background paper submitted to the National Committee on Excellence in Education, August 31, 1982. (Appearing in Educational Researcher, Vol. 14, Number 4, 1985.

Resnick, Lauren B. "Introduction: Research to Inform a Debate." Phi Delta Kappan, May 1981, pp. 623-624. (Appearing in Educational Researcher, Vol. 14, No. 4.

Roberson, E. Wayne Ed. "Educational Accountability Through Evaluation." Englewood Cliffs, NJ: Educational Technology Publications, 1971.

Roberts, A.D. and Cawetti, G. Redefining General Education in the American High School. Association for Supervision and Curriculum Development, 1984.

Robertson, Sandra, Keith, Timothy and Page, Ellis. "Now Who Aspires to Teach?" in Educational Researcher, Vo. 12, June 1983.

Rock, D.A., Goertz, M.E., Ekstrom, R.B., Hilton, T.L. and Pollack, J. "Factors Associated With Test Score Decline." Educational Testing Service, 1984.

Roeber, Edward D. "Survey of Large-Scale Assessment Programs." Michigan Department of Education, 1984.

Rosenshine, Barak. "Teaching Functions in Successful Teaching Programs," (prepared for National Institute of Education). February 1982.

Salmon-Cox, Leslie. "Teachers and Standardized Achievement Tests: What's Really Happening?" Phi Delta Kappan, May 1981, pp. 631-634.

Sandefur, J.T. "State Assessment Trends," in AACTE Briefs, March 1984, pp. 17-20.

Schalock, Del. "Research on Teacher Selection," in Review of Educational Research, David Berliner (ed.), Vol. 7, 1979, p. 408.

Schrader, William B. ed. "Measurement and Educational Policy." New Directions for Testing and Measurement No. 1, 1979. San Francisco, Ca.: Jossey-Bass, 1979.

Scriven, Michael. "How to Anchor Standards", Journal of Educational Measurement, Vol. 15, No. 4 (Winter 1978), pp. 273-275.

Sedlak, M., Wheeler, C., Pullin, D., and Cusick, P. "Classroom Perspectives on High School Reform: Bargains, Students Disengagement, and Academic Learning." Draft. Michigan State University, 1984.

Serow, Robert C. "Competency Testing as a Social Policy: An Analytical Framework and Results." Paper presented at Annual Meeting, American Educational Research Association, 1982.

Shanker, Albert. "The Nonsense of Attacking Education Tests." Washington Post, October 19, 1980.

Shedd, Mark R. "Tests and Diplomas: Certifying High School Education." In "Measurement and Educational Policy." Schrader, William B. ed. New Directions for Testing and Measurement No. 1, 1979. San Francisco, CA: Jossey-Bass, 1979.

Sizer, Theodore. "Horace's Compromise: The Dilemma of the American High School," Houghton Hifflin: Boston, 1984, p. 180.

Sproull, Lee and David Zubrow. "Standardized Testing From The Administrative Perspective" Phi Delta Kappan, May 1981, pp. 628-631.

"Students' Scores on Tests Climb in Connecticut." New York Times, 1/24/84, p. B2.

Sumners, Anita. "What Helps Fourth Grade Students Read?" Department of Research, Federal Reserve Bank of Philadelphia, 1979.

Sykes, Gary. "Teacher Preparation and the Teecher Workforce," National Institute of Education (no date).

Thurston, Paul and House, Ernest R. "The NIE Adversary Hearing on Minimum Competency Testing." Phi Delta Kappan, October 1981, pp. 87-89.

Twentieth Century Fund. "Making the Grade." Task Force on Federal Elementary and Secondary Education Policy, New York, 1983.

U.S. Department of Education. The Nation Responds: Recent Efforts to Improve Education. 1984.

Vance, Vitcor and Schlechty, Phillip. "The Distribution of Academic Ability in the Teaching Force: Policy Implictions," in Phi Delta Kappan, September 1982, pp. 22-27.

Ward, Annie W., Margaret E. Backman, Bruce W. Hall, and Joseph L. Mazur, eds. Guide for School Testing Programs. East Lansing, MI: National Council on Measurement in Education, 1978.

Wardrop, James L. Standardized Testing in the Schools: Uses and Roles. Monterey, CA: Brooks, Cole Publishing Co., 1976.

Weaver, W. Timothy. "In Search of Quality: The Need for Talent in Teaching," in Phi Delta Kappan, Vol. 61, no. 1, September 1979, pp. 29-32.