DOCUMENT RESUME

ED 051 314 TM 000 730

TITLE	Invitational Papers Submitted to the Select Education Subcommittee of the Education and Labor Committee of the U. S. House of Resprsentatives.
INSTITUTION	Educational Testing Service, Princeton, N.J.
PUB DATE	Mar 71
NOTE	208p.
EDRS PRICE	EDRS Price MF-$0.65 HC-$9.87
DESCRIPTORS	Admission Criteria, College Admission, College Students, Developmental Psychology, Economic Opportunities, *Educational Change, Educational Opportunities, Educational Planning, *Educational Research, Equivalency Tests, *Evaluation, *Higher Education, Income, Infants, Learning Motivation, Measurement, Minority Groups, Negro Students, *Racial Integration, School Community Relationship, State Surveys, Teacher Role, Tuition Grants
IDENTIFIERS	Open Education

ABSTRACT

These invitational papers submitted by ETS staff members to the Select Education Subcommittee discuss various aspects of educational change and improvement, planning and evaluation. Papers include: "Open Education: Changing Schools for Children," (Edward A. Chittenden); "Planning for New Students to Higher Education in the 70's," (K. Patricia Cross); "The Desegregation/Integration Dilemma in Higher Education: Implications for Research from Minority Student Experiences," (Junius A. Davis); "Statewide Assessment: Its Future and Potential for Educational Reform" (Henry S. Dyer, Robert J. Solomon); "Mass Higher Education and the Economic Benefits of a College Degree," (Rodney T. Hartnett); "Learning to Learn in Infancy: The Development of Competence Motivation," (Michael Lewis); "Teaching in the Knowledge Society," (Frederick J. McDonald); "Credit by Examination and the External Degree," (Robert J. Solomon, John R. Valley); and "Meeting the Measurement Needs of Education," (William W. Turnbull). Most of the papers include bibliographical references. (CK)

EDUCATIONAL TESTING SERVICE

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1971

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OPEN EDUCATION: CHANGING SCHOOLS FOR CHILDREN*

Edward A. Chittenden

Educational Testing Service

Interest in "open education" has been growing at such a rapid rate during the past two or three years that it may be considered to reflect an educational movement of significant proportions. In part this trend has been stimulated by the reforms going on in the British primary schools. To a greater extent it testifies to the growing conviction on the part of parents, teachers and students, that our schools must somehow become more humanized--more responsive to the people they serve and less controlled by institutional routines and technological requirements.

At present this movement is loosely defined, as it has grown out of a variety of influences and encompasses a wide variety of educational programs. This paper attempts to identify issues which constitute the core elements of this general type of educational change and considers some implications for programs of research and evaluation. Although the paper centers on kindergarten and elementary school education, it is believed that these issues find parallel expression

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in changes currently going on at the secondary school and college levels.

It should be noted at the outset, that the rapid growth of interest in open education has brought with it the hazards of well-intentioned but hastily formulated attempts at reforming the schools. Judging from the literature and from experience in the field, there are various interpretations of what "open" education is and what it has to offer. Some school systems are introducing "open education" through administrative fiat--trying to create instantly the kinds of programs that, by definition, require a substantial period of growth. In some schools there are isolated teachers who experiment in protest against the larger systems but who rarely have an influence beyond their own classroom door. In still other schools, walls are knocked down and the ages are scrambled, but not much thought is given to why these actions are undertaken or whether anything else should be changed. Finally, in reacting against the rigidities of the conventional curriculum, many educators perceive open education to be a rationale for "laissez-faire" classrooms in which adult planning is thought to be relatively unimportant or even harmful. Such experimental efforts can lead to better ways and may thus represent first steps in new and better directions. But they can also lead to disillusionment and to premature rejection of that which is sound in the movement toward "opening-up" the schools.

It should be obvious from these preliminary remarks that the phrase "open education" is not a very satisfactory one with which to designate a collection of educational approaches which may share only a few features in common. Other labels come to mind: "informal;" "unstructured;" "British infant school model;" etc. For the present time, however, as programs undergo definition and re-definition, "open," being freest in connotation, may be the most useful label.

Institutional Mindlessness

If one criticism could be said to be the key to understanding current interest in open approaches, it would be that our public schools have become institutions of lifeless routines. The schools are accused of being utterly unresponsive to the needs of their constituents...their children, their teachers, and their parents. It is claimed that curricula, methodologies, and regulations, are carried out in such a way that the staff and the children are caught up day after day, in an enactment of routine exercises, in community after community, all of which goes under the guise of education. The widely read accounts of such teacher/writers as Holt (1964), Kohl (1967) and others have done much to stimulate thought about these issues. In a recent, comprehensive study and critique, Silberman has documented the lifelessness and oppressiveness of many of our schools. He summarizes as follows: "Because adults

take the schools so much for granted, they fail to appreciate what grim, joyless places most American schools are, how oppressive and petty are the rules by which they are governed, how intellectually sterile and esthetically barren the atmosphere, what an appalling lack of civility obtains on the part of teachers and principals, what contempt they unconsciously display for children as children" (1970, p. 10). In his view, as in the view of others, the heart of the problem is best characterized as a malady of institutional "mindlessness."

Insofar as the problem is perceived as institutional, there is guarded optimism about the possibility of bringing about change within the present system. "What makes change possible, moreover, is that what is mostly wrong with the public schools is due not to venality or indifference or stupidity, but to mindlessness" (Silberman, 1970, p. 10). If school programs can be opened up to the creative energies of their pupils and staff, much can be accomplished. To bring about major change, we do not need to wait for whole new crops of teachers, new sets of instructional materials, or overhauls of school buildings. Other critics seem less optimistic about the possibilities of change within existing institutions. At the very least, they call for extensive training or external advisory support programs for teachers. Still others see a solution only in the development of new forms of schooling that are entirely outside of the existing framework.

Criticism of the school as institution has been advanced not only by journalists and teachers but has also been emerging in the literature of curriculum development and evaluation. John Goodlad, for example, in reviewing a decade of educational reform concludes that past innovative efforts had made very little impact on the schools. "The findings were unequivocal. So far as our sample is concerned, school reform had been blunted on school and classroom door" (1970, p. 4). As visitors and observers, Goodlad and his staff were struck by the rigidity and unvarying character of the school day and by the fact that the schools continued to operate in ways which ignored the resources and needs of the communities they served. These are precisely the kinds of observations made by others.

In sum, the argument that the schools as institutions are failing our children is a broadly documented thesis that is finding an increasingly responsive audience. Seen in such light, the moves toward opening education can be considered to represent efforts to "re-humanize" the schools.

Involvement of Children

Several lines of action aimed at opening up the schools have been advanced. The most important of these, and the one that is most commonly stressed, is based upon the conviction that children should be given a central role in influencing the course of instruction. In part, this position rests on evidence (Piaget, 1970;

Rogers, 1969) that learning which takes place in the context of meaning and purpose from the learner's viewpoint has a much more significant impact on developing capabilities than does the passive type of learning which is commonly associated with conventional programs. The position reflects the belief that this kind of educational environment can foster self-confidence and the skills to think creatively and constructively--qualities that should be the foremost concern of the educator.

Teaching begins with the assumption that the children come into a classroom with capabilities and experiences--shared and unique--and it is the teacher's job to see that these resources of the child give direction and meaning to his learning. Such teachers would take Ausubel's fundamental principle seriously: "If I had to reduce all of educational psychology to just one principle, I would say this: The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly" (1968, p. vi). The curriculum must therefore be adaptable to the child, not the other way around. Individual differences are prized, not deplored. "The 'child centered' attitude of the 'progressive' teacher is likely to involve a positive valuing of individual differences as against a mere toleration of them. . . This positive valuing of individual differences is evidenced, for example, by organizing classes heterogeneously rather than homogeneously with respect to ability

and perhaps to age" (Tamburrini, 1971, p. 7). This is a viewpoint which leads to programs that clearly differ from the strict readiness programs in which the task is seen as one of preparing or remediating children to meet the standard curriculum.

Opening up to the children in such ways appears to be a principal accomplishment of the changes in British primary schools. There are now a number of accounts of what such classrooms can look like (for example, Howson, 1969; Rogers, 1970). Observers are struck by the diversity of activities that may be going on at any given time and by the fact that children take on a central role in determining the nature of these activities and in assuming responsibility for carrying them out. Instructional activities take many forms: these include interactions between the teacher and groups of children or an individual child; instruction from peers; activities with structured learning materials, with books and environmental projects, etc. The point is that children in such schools are expected to learn through many different means, in contrast to the conventional school where most learning is channeled through the teacher. The success of many British schools and the reports of those successes have served to convince many American educators that "it can be done."

Involvement of Teachers

A second major way to revitalize the schools is to open up new responsibilities and options for teachers and school staff. Many educators involved in the curriculum reform efforts of the 1960's have come to the conclusion that the scope and permanence of any innovative process is determined by the extent of staff involvement and commitment to that reform (Armington, 1968; Clark, 1965; Hawkins, 1968; Weikart, 1971). They suggest that the usual way of putting new ideas or materials into schools (e.g., introducing team teaching, new math programs, language labs) is like dropping a stone in a pond. The effect in ripples may be immediately apparent but after a while the pond returns to its original state; broken machines remain unrepaired; team teachers stake out old territories; "new math" becomes routine arithmetic. The superintendent and the inventor may have received some publicity in the course of the enterprise, but nothing of lasting significance has happened in the lives of the children in that school. To make efforts toward change more significant, these educators recommend a program of action that builds upon the staff's present capabilities and enlists them in experimentation. Sometimes the changes toward open education have represented an abrupt change in what is required of the teacher. (Basal readers may be replaced by a variety of books; rows of seats are removed; projects replace workbook assignments; etc.) More often a more

gradual course of change and experimentation on the staff's part is adopted. For example, the teacher might begin experimentation with individualized approaches in certain aspects of the curriculum, or at certain times of day, or in certain areas of the room. In any event, the important point is that the staff must take a central role in such experimentation. Without such continual participation, an open approach can be just another package that becomes routinized in its own way. While the staff needs to be able to draw upon the theoretical advances and discoveries of educational research and development, it is equally important that they remain alive to their own particular situation. To quote Goodlad again, ". . . the creation of conditions essential to the support and conduct of each individual school as a self-renewing change agent may very well be the prime educational challenge of the 1970's" (1970, p. 5).

There are currently several groups in the United States who are attempting to develop advisory systems of assistance to teachers as a mechanism for facilitating change. Advisory centers have been playing an important part in the development of schools in England, but the idea of the advisory is relatively new in this country, and is being tried out in several forms. Unlike the supervisor who is a general evaluator of the teacher's performance, the advisor seeks to establish a different sort of role. In place

of general directives, the advisor seeks to give help and advice that is tailored to the needs of each school or classroom. "His aim always is to help schools realize their own unique potentialities and to help make change self-sustaining" (Armington, 1968).

The process of developing a successful open approach can be best described as an evolutionary construction on the part of the staff as against a process of implantation of a fully developed model. The paradigm of the "teacher-proof" curriculum wich has been associated with many experimental programs in early education during the past decade is profoundly different from the teacher-involvement paradigm that is so much a part of the open education movement. Understandably, the interested principal, parent and teacher, mistakenly look for the open-education "package" or the "how-to-do-it" manual, when in fact there is no "it" that can be separated from persons who wish to "do it." The directions in which a school is changing, the substantive nature of these changes, and the prospects that growth and improvement will continue, are really more important factors to consider than whether the school matches up to some external model.

Community Involvement

A third line of action in opening the schools concerns participation of parents and other members of the community.

While not stressed in the British literature community involvement has been the foremost consideration and point of departure for several efforts in this country (Haskins, 1969). [It should be noted that an emphasis on parent involvement is not necessarily associated with concern for involving the children, although such emphases frequently do coincide.] To re-vitalize schools, there have been efforts to open the school to resources and talents of the surrounding community in the hope of making instruction more relevant to experiences of children and of bridging the classroom, home, and larger community. In conventional programs, the curriculum and associated hardware of a second grade classroom in urban New York may be indistinguishable from that of a second grade in rural Oregon or suburban Maryland. By contrast, a visitor to these more open settings would become much more aware of a specific community.

The Problem of Definition

Alternative ways of defining open schools have received attention in the literature. For some, "open" is seen in architectural terms: the walls between classrooms are knocked down. Others seek to introduce change by administrative rearrangements such as shuffling the ages and grades. Such alterations may or may not be accompanied by significant changes in the roles of adults and children. An open-space program, or a non-graded program, for

example, need not necessarily lead to opening the schools in the senses discussed above.

In summary, no single set of objectives or instructional prescriptions can be drawn up to define open education in this country. Instead, there appear to be directions of change aimed at bringing schools back to life by making them more responsive to the children, the staff, and the community. There is no single document to which one can turn to discover what open education "really is." In fact, many practitioners are wary of the use of models or prescriptions in the belief that labels lead the teacher and parent to take up false issues and thus to lose sight of what is really going on in their schools. Mindlessness once again starts to replace common sense.

Implications for Research and Evaluation

The following discussion of implications for research and evaluation incorporate recommendations from an earlier report prepared at ETS as part of a study of open education (Bussis and Chittenden, 1970).

Examination of Educational Process

Concern with the roles of adults and children and with the setting in which education takes place makes apparent the need for evaluation procedures which adequately examine the process of schooling. As Jackson (1968) has pointed out, any educational program prescribes a setting for human activity and thus a way of life--at least a way in which young people are expected and required to live during many of their waking hours. While different educational programs may state similar objectives with respect to learning, they often establish very different methods in trying to reach these goals, thereby reflecting different philosophical assumptions about life values. In evaluating current efforts at changing our schools, these assumptions should be made explicit, and accurate description regarding the quality of school life should be a foremost concern of the evaluator. A second reason for examining educational process rests on the assumption that such processes have greater influence on the child's development as a learner than any given body of curricular content.

On a more practical level, the study of process is necessary insofar as judgements about a program's impact depend upon adequate information as to whether and how that program has been implemented. The point is a simple one but has often been ignored in practice. Many evaluation designs (particularly in early education) end up treating all classrooms that bear the same label ("open," "Computer assisted instruction," "Montessori," or whatever) as though they have actually been doing similar things. Cohen (1970) discusses this problem at some length, particularly with respect to the evaluation of large-scale social action programs, and Rosenshine raises the issue in relation to instructional evaluation:

> In studies where teacher behavior in special curricula was compared with the behavior of teachers in "traditional instruction" . . . there often was significant variation in the behavior of teachers within each group. Although the number of classrooms observed in these studies is small, the results are consistent enough to cause serious doubts about whether all classrooms using the same curriculum constitute a single treatment variable. (1970, p. 280)

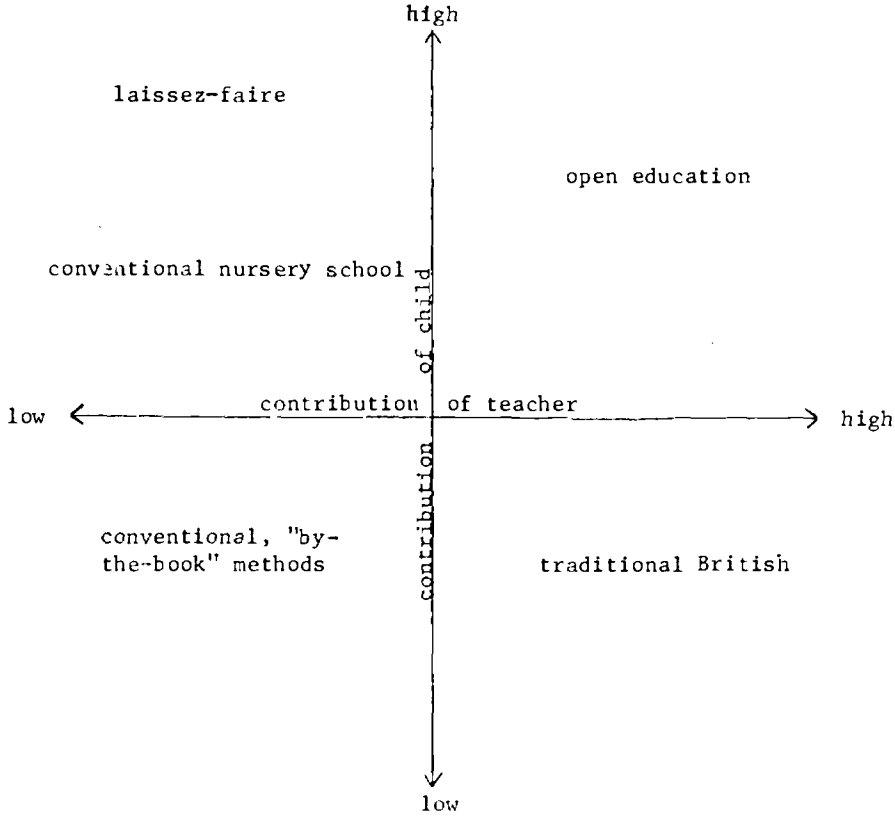
The complex problem of conceptualizing classroom process in ways which permit meaningful comparisons between educational programs has been a difficult one. In past studies, a commonly used dimension compares classrooms along some continuum of "child-centeredness" to "adult-centeredness." At one extreme is the setting completely controlled by the teacher and organized around highly structured lessons; at the other extreme are

classrooms in which children supposedly set the entire direction of learning . . . and a wide variety of positions in between. An important finding which emerges from a close examination of the open approaches is that they do not fit comfortably at any point on such a scale. They are simultaneously child-centered and adult-centered. Children may be given more leeway in decision making, but despite such child-centeredness the adult does not withdraw into a supportive valet-type role. Instead, teachers are encouraged to adopt an experimental attitude and to come alive in their relationship with the children. It is beyond the scope of this paper to attempt to analyze the teacher's role, but it appears that such qualities as respect and honesty are central to understanding how the adult and child can work together. When children can openly participate in establishing purposes of learning, then the relationship between teacher and child begins to change in the sense that the teacher's contributions are understood, by the child, as guidance in learning and not as general directives of uncertain intent that must somehow be complied with. In this context the teacher can be highly active in offering suggestions, introducing materials, demonstrating ways of doing things, expressing opinions, with the expectation that the children can react to the real content of such instruction.

In Figure 1 a scheme is depicted that treats questions of child-centeredness and adult-centeredness as independent

Figure 1[1]

Double Classification Scheme Based on Extent to which (1) the Individual Teacher and (2) the Individual Child is an Active Contributor to Decisions Regarding the Content and Process of Learning



1 adapted from Bussis & Chittenden, 1970

dimensions rather than as opposite ends of a single continuum. The upper right-hand quadrant, with high contribution by both adult and child, represents the directions of open approaches. In the lower right quadrant, the teacher's involvement in what she is doing may be clear and articulate, but there is little room for contribution from the children. Teachers of this sort give a great deal of thought to their instruction and will throw out the usual procedures when it seems warranted, but they tend to dominate the center stage. The traditional British teacher with a strong professional posture may be an example. The upper left quadrant signifies classrooms with extensive pupil contribution, but where the adults provide passive support (as in some conventional nursery schools) or else abdicate responsibility almost entirely. Finally, in the lower left quadrant might be located extreme examples of institutionalization. Here, the children carry out the lessons assigned by the teacher who in turn is carrying out a program that was devised by someone else. Routine teaching and low personal involvement may characterize such settings.

Assessing Learning and Development

Questions of what to measure and how to measure it are difficult to answer when the evaluator (parent, teacher, researcher) is faced with a program in which children may pursue many different directions in learning (Minuchin, et al., 1969).

Analysis of the priorities of educational programs with broad objectives suggests four major aspects of the child's development that could be examined. Within each of these areas certain directions for research and instrument development are recommended.

Resourcefulness and Proficiency. The assessment of achievement needs to be broadened in directions which would assess the child's own contributions to learning and the extent to which his resources have been brought into play. A construct of "proficiency" seems more appropriate here than the customary definition of achievement. To be appropriate to priorities of open approaches, assessment procedures in areas of learning (such as mathematics or language usage for example) should aim at assessing proficiency and versatility in performance. What do the learnings in question mean to the child? Does he apply them in various ways? Are they truly an integral part of his repertoire? Parker and Rubin (1966) point out that in classrooms where the stress is on process of learning ". . . the assimilation of knowledge is not derogated, but greater importance is attached to the methods of its acquisition and to its subsequent utilization. Therefore, a discrimination must be made between knowing something and knowing what it is good for . . ." (p. 2). Existing tests may measure whether the child knows something, but they are not as useful in assessing whether children know what it is good for. Tests of proficiency

could build on existing instruments but should be specifically extended to include measurement of judgement and performance.

Self perception. Of principle interest here is the assessment of the child's feeling about himself in relationship to school and school-related experiences. Are children in open settings more likely to develop a perception of themselves as active organizers of their own learning and contributing participants in the classroom? Instruments developed in this area could be used to obtain information about whether the child views school as a place to learn or a place to be taught and whether he has confidence in his own capabilities.

Personal and Cognitive Styles. Focus on this aspect of behavior proceeds from the assumption that the more open classroom permits and encourages considerable exploration with different styles of functioning. Although research demonstrates that personal and cognitive styles are rather stable characteristics, it is suggested that children in open settings evidence greater flexibility in such traits than might ordinarily be expected. Thus, there is reason to expect less evidence of role caricature (the "overly-neat," the "class clown," the "hopelessly impulsive" child) in an open classroom than in a more traditional one. Modifications of existing research instruments as well as new measures would need to be used in this area.

Self-others Frame of Reference. Peer interaction is a marked characteristic of open settings, and children are expected to learn a great deal from each other. Observation of peer interaction and individual functioning in the open classroom leads to a general formulation regarding the balance between self and others as a frame of reference for behavior. Two sets of questions are suggested for measurement purposes. The first involves communication situations. Are children learning to take active and adaptive roles in instructing each other, whether this role is one of the communicator who adapts to the needs of a listener or the role of the listener who actively seeks out information when something is unclear? The second set of questions deals with reliance on self in matters of judgement and opinion. To what extent does the child express opinion in the context of peer values which may oppose that opinion? Does greater peer interaction foster greater peer conformity, or does the open setting provide a better opportunity for children to learn to balance their own interests with those of their classmates?

Assessment of School Programs

If evaluation of student achievement in a school system is undertaken, it should include appraisal of school practices. As illustration, numerous examples can be given of school systems which boast of reading scores "above the norm," but in which there is a limited

variety of books in the classroom and the library is more concerned with cataloguing than circulation. In such cases (which are not rare) the skill is valued but not its practice, and any evaluation which does not make such a fact apparent is an inadequate evaluation.

To continue with reading as an example from the perspective of open education at least four types of questions should be raised in evaluating student achievement. (1) Motivation: How do the pupils feel about reading? Do books and other printed material provoke feelings of inadequacy or do they stimulate interest? Preference measures should be used along with indices of whether the children are actually reading beyond the minimum requirements of assigned books. (2) Opportunities for reading: Are children provided with appropriate material and the time for reading? Is a variety of books available or does the supply consist of 30 copies of the same reader. Is there an area conducive to reading? (3) Ability: Measures of skill, comprehension, and interpretation could be included under this heading. (4) Literacy: Is the child literate in that he has a sense (or beginning sense) of authorship. An understanding that books may be written because someone had something to say? Does he read for various purposes such as the gathering of information, exercising imagination, fantasy, and the development of aesthetic appreciation?

In summary, if assessment of student achievement within an educational system is to be undertaken, it is as important to appraise the environment provided by that system as it is to test the children. Comprehensive assessment along the lines sketched above would be compatible with a comprehensive view of education.

Research on Learning and Educational Change

While examination of the open approaches suggests many possible directions for research, there are two lines of investigation which seem of special importance for what they can contribute to understanding and implementation of new programs.

Teacher's role. Questions concerning teacher preparation and in-service training are clearly of prime importance for further study. What sort of assistance, in both its practical and theoretical forms, do teachers need in order to bring about more open approaches to instruction? To what extent can a school build upon its resources of staff and community and what is needed in the way of advisory assistance? Several groups in this country are presently engaged in trying to establish new ways of facilitating the development of school staffs. From systematic study of such attempts much could be learned that would lead to changes in our present teacher education methods--methods that are widely admitted to be archaic and inefficient.

Classroom Studies. Intensive study of a limited sample of children in several good open schools appears to be an urgently needed research endeavor. Are these children learning in ways which corroborate existing assumptions about learning? Methodology in such studies might primarily be observational but should include periodic testing, interviews, and analyses of children's products. The need for intensive study is probably greatest from the first grade level on, where the differences between open approaches and traditional practices are much more evident than in kindergarten or preschool. One focus for such research might be an examination of the validity of the open approach to reading instruction which emphasizes purpose and meaning. This view of learning to read has not frequently been studied in educational research because of a dearth of appropriate settings in which to study it. With the exception of some published work on early readers who have learned in the home, reading research has generally investigated how children cope with prescribed methods of instruction rather than with how they acquire reading capabilities when the options of whether to read, why read, and what to read are much greater.

In general, studies of learning in the open settings not only would provide invaluable information for the practice of teaching but could also constitute a rich new source of research information on the nature of learning.

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PLANNING FOR NEW STUDENTS TO HIGHER EDUCATION IN THE 70's*

K. Patricia Cross

Educational Testing Service

There will be a New Student in colleges and universities in the 70's, one who requires new approaches to education. Traditional higher education was designed in a different era for a different kind of student, and the formulations for education that served academically-oriented youth a half a century ago are no longer adequate.

Planning for New Students requires an analysis of where we are now and where we would like to be by the end of the decade. The question of where we are now must be answered by research. The question of where we would like to go must be answered by society. This paper will attempt to analyze the answers to these questions.

Who Should Go To College? Changing Philosophies

In the history of higher education in this country there have been three major philosophies about who should go to college. At the

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* Prepared for the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives.

turn of the century, the majority of college students came from the homes of wealthy aristocracy. Students who attended colleges had money and family social status. Some also had academic interests and abilities; others did not. Basic to the aristocratic philosophy of college admissions, was the premise that the young people who should go to college were those who could afford it and who needed it to carry out their station in life. The poor, ethnic minorities, and women, it was assumed, would not follow life patterns that really made use of a college education. The colleges that were developed to serve the aristocratic philosophy were private high-tuition colleges. Whether a boy would go to college was predictable from birth. It was a closed system, and some were "in" and others were "out."

Actually, colleges of the aristocracy probably did not give much thought to erecting barriers that would keep people out of college. It simply did not occur to anyone that a young man should attend college if he did not have the money to do so. The thesis is easier to understand when viewed through the meritocratic perspective of our times.

To many, if not most people today, it is unthinkable that a student should attend college if he does not have the ability to benefit from the instruction offered. Only in recent years

have we started to question whether the "instruction offered" might change so that it would "benefit" a new seg ent of the population who wished to attend college. In an earlier day, those who challenged the assumptions of the aristocracy asked the same question, why couldn't colleges change so that a broader segment of the population could attend? And, of course, in the long run colleges did change. But it was not the old colleges that had been developed to meet the needs of the aristocracy that changed first. The challenge came, not by breaking down the gates to the aristocratic colleges, but by opening new gates through which a new generation of college students poured so rapidly that the high tuition colleges no longer determined who would be college educated.

The revolt against aristocratic philosophies of college admissions was led by those who maintained that a college education was an earned right, not a birthright. Advocates of the new meritocracy that was ushered in by the land grant universities felt that criteria for college admission should be based upon scholastic ability and the willingness to study hard; i.e., upon academic "merit." Much as the aristocratic colleges had assumed that what they had to offer was static and designed for an elite portion of the population, so the colleges of the meritocracy assumed that there was a certain fairly small portion of the

population that had the ability to benefit from what they offered. Considerable attention was given in the late 1940's and early 1950's to the determination of the size of this group. The President's Advisory Commission on Higher Education of 1947 estimated that 49 percent of the population could profit from at least two years of post high school education and that at least 32 percent had the capacity for a normal 4-year college course. After considering this figure in conjunction with the observation that, "...most experts estimate that about 25 percent of the population can do college work profitably," Hollinshead's report for the Commission on Financing Higher Education concluded that, "...perhaps 35 percent of youth might be expected to profit substantially from formal full-time post high school education of the kind given at present by such institutions" (Hollinshead, 1952, p. 138).

The rise of the meritocracy was regarded by almost everyone as a move that, in the best traditions of the country, led to the democratization of higher education. There is no little irony in the fact that while the advocates of the meritocracy were zealously breaking down the barriers imposed by the aristocracy they were quite consistently erecting their own barriers. And academic aptitude tests were the instruments that served both to destroy the old aristocracy and to erect the new barriers

of the meritocracy. The "talent searches" of the 1950's were active campaigns to bring into the colleges those who did not meet aristocratic criteria but who were the epitome of meritocratic ideals. The very good student who was the son of the immigrant cobbler was the hero of the meritocracy--no money, no family social status, but lots of academic talent and a willingness to work hard.

Now once again we find ourselves in a period of philosophical transition regarding the question of who should go to college. Once again, there is pressure to democratize higher education by bringing it within the reach of a broader segment of the population. Once again there are demands for new answers to the old question of what proportion of the population the colleges should serve. The egalitarian challenge to the meritocracy looks strikingly familiar. The nature of the questions raised as well as the patterns of instituting change are not unlike those of a century ago. A new sector of the public is being represented by new students in colleges and universities. This group of New Students to higher education are repeating history by entering the system, not so much by breaking down the barriers erected by the meritocracy, although there is some of that, but by flocking to a new kind of a college dedicated to serving a different clientele.

It appears that in 1970, the prevailing attitude in the country is still largely meritocratic, but there are signs everywhere of a straining at the barriers. The mingling of meritocratic and egalitarian philosophies is the occasion of considerable controversy among educators as well as in the popular press. The sign of the times is illustrated by a headline reading: "Open Admissions: American Dream or Disaster?" (TIME, October 19, 1970). At the same time that the formerly selective, tuition-free City University of New York was instituting egalitarianism by throwing open its doors to all 1970 New York City high school graduates, regardless of academic "qualifications," the 1970 President's Task Force on Higher Education was embracing meritocracy and attempting to clear away the last vestiges of the aristocratic era by recommending financial aid to "students of all races who have the desire and ability to profit from post high school education..." (emphases added). John Gardner has asked, can we be equal and excellent too? Can egalitarianism and meritocracy coexist? What happens to the value of the college degree when everyone has one? Is there some fixed concept that represents "college" that will permit us to say who should attend? Should higher education serve those who can "profit" from traditional offerings or is there an obligation to change the offerings to meet the needs of those who wish to attend college?

Almost everyone wishes to attend college today--a simple fact of life that means most voters want college education for their children. On the eve of the egalitarian phase of college admissions, we find ourselves concerned about how to get young people into college rather than about how to keep them out.

As a matter of fact, in the decade just past, we have given considerably more attention to the procedures of getting New Students into college than we have to the educational questions of what to do with them once there. When colleges maintain the right to select who shall study with them, an educational "match" can be made by choosing students who fit the college. When colleges forego the right to select, the match has to be made by designing educational programs to fit the students. To date, we have concentrated on making New Students over into the image of traditional students so that they may be served by traditional education. Our concern has been the creation of access models to education.[1] We have devised all kinds of ways to make New Students eligible to participate in traditional higher education. Remedial courses are designed to remove academic "deficiencies"; counseling removes motivational "deficiencies"; financial aid removes financial "deficiencies."

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1 For a discussion of some alternatives, see Cross, 1971.

If the answer to the question, who should go to college, is to be an egalitarian response of "everyone," then the task ahead will involve the recognition that educational systems will have to be designed to fit the learning needs of New Students. Who are the New Students? Under an egalitarian philosophy of 14 years of schooling for everyone who wants it, New Students will be high school graduates who are not now continuing their education. Research provides some information about who is going to college now, and this enables us to look at the reservoir of New Students--those who will be entering some form of postsecondary education in the 1970's.

Who Is Going To College? Some Barriers to Attendance

Who are the young people who are entering college today? And as the corollary, who are the young people who are not entering college? Most laymen recognize that bright high school graduates are more likely to continue their education than those who have had to struggle for grades throughout high school, that doctors' sons are more likely than laborers' sons to attend college, that whites are more likely than blacks, and men are more likely than women to seek further education. These elements of the folk wisdom about who goes to college can be cast into more precise and accurate information through research.

Two dimensions that researchers have been able to measure seem to hold primary roles in explaining who goes to college, where they go, and even how long they stay. Socioeconomic status (SES), which includes measures of family occupation and parental education, and academic ability are the two most powerful measures we have of who goes where to college.

Some of the most important data extant on the interrelationships between SES and ability in college attendance rates have been presented by Schoenfeldt (1968) for Project TALENT high school graduates of 1961, and by Dr. Thomas Hilton who analyzed ETS Growth Study data for 1967 high school graduates using the same scheme of tabulation.

TABLE 1

Probability of High School Graduates in 1961 and 1967
Entering Some Form of Postsecondary Education

Ability Quarter	Socioeconomic Quarter							
	1 - Low		2		3		4 - High	
	1961	1967	1961	1967	1961	1967	1961	1967
Male								
1 - Low	21	48	28	55	30	40	51	65
2	37	57	47	58	51	69	61	79
3	47	74	52	77	66	79	82	88
4 - High	69	82	83	89	87	93	93	94
Female								
1 - Low	14	39	25	41	26	55	39	60
2	26	40	27	44	41	64	57	76
3	38	52	51	58	54	77	76	86
4 - High	58	69	66	77	84	88	91	95

Sources: 1961 graduates, with 1962 follow-up, Schoenfeldt, 1968.
1967 graduates, with 1968 follow-up, ETS Growth Study data analysis by Hilton.

Table 1 shows the two sets of data side by side. The two sets of data were not designed to be comparable, but we can be rather certain of some things. For example, the probability is extremely high that the son of a surgeon who has been an A student in high school will continue his education. For young people ranking in the top quartile on both SES and ability there is little difference between the two sets of data. Almost all of this group enter college, there has been little change over the past decade; i.e., it has reached the saturation point. The 6 or 7 percent of this highly privileged group who don't attend college may be prevented from doing so by illness or other unusual emergencies. In 1970 the fact is that very few additional college students are to be expected from among high school graduates high in both academic aptitude and socioeconomic status.

At the other extreme are the doubly disadvantaged, those scoring in the lowest quartile on both SES and ability. The lowest probability for college attendance occurs in the cells in the upper left hand corner of the tables. For example, in the 1961 TALENT sample, 21 out of 100 lowest quarter SES males who also scored in the bottom fourth of the class on a test of academic ability entered some form of postsecondary training following high school graduation; for women it was only 14 percent.

At the beginning of the decade of the 60's we could predict with fairly reasonable accuracy the probability of continued education for young people in the extreme cells of Table 1. For men, for example, we would have been correct 93 times out of 100 in predicting that a high-ability, high SES student would enter postsecondary education; we would have been correct 79 times out 100 in predicting that a low-ability, low SES student would terminate his formal education with a high school diploma.

The effectiveness of the meritocracy of the 1960's is clearly evident in the 1957 ETS Growth Study data. We can predict that an extremely high percentage of boys who make high test scores will embark upon postsecondary training-almost all of them in 2- or 4-year colleges--in the 1970's; 82 percent of the males in the top ability quarter of the ETS sample continued their formal education after high school graduation in 1967 even if they ranked in the lowest SES quartile. The handicap of low socioeconomic status was not as serious for boys in 1967 as the handicap of low academic ability. If a boy met meritocratic standards of above-average school achievement--as measured by traditional academic aptitude tests--he was very likely to continue his education. Over 80 percent of the boys who ranked in the upper half of the class academically were going on to college.

Women have not yet emerged from the aristocratic era of college admissions. Their probability of college attendance is influenced as much by socioeconomic factors as it is by the achievement factors of the meritocracy. The greatest discrepancies between the college-attendance rates of men and women exist among high ability students who are below average in socioeconomic measures. A bright but poor male has a better chance of continuing his education than has his equally able sister. Much of the difference can be attributed to parental attitudes. Census Bureau interviewers found that the higher the educational level of the parents, the less they were likely to distinguish between the educational needs of sons and daughters. For example, 73 percent of the mothers with a grade school education wanted college for their sons, but only 60 percent expressed the same desire for their daughters. Among mothers who had attended college, there was virtually no difference in the education desired for males and females--98 percent wanted sons to go to college and 97 percent wanted college for their daughters (Froomkin, 1970). The large increases in college attendance for women are now coming from the ranks of above-average students from all socioeconomic levels, as women continue toward the peak of the meritocratic era in college attendance. For men, the meritocratic phase has passed its peak and in the decade of the 70's, the major increases in college attendance will come from lower-ability men.

As we move into the egalitarian phase of college admissions, the remnants of the earlier aristocratic and meritocratic phases can be observed. Both SES and academic aptitude have powerful influences on who goes to college. The effect is especially potent when they occur in combination. Young people, men and women, in the upper half in both ability and SES have a high probability of continuing their formal education--at least three-fourths are doing so. Young people in the lower half on both ability and SES are not as likely to continue their education, but for boys, over half are embarking upon some form of postsecondary training; for lower-half women about four out of ten high school graduates are pursuing further education.

Who Will Go To College? New Students To Higher Education

The decade from 1965-1975 is likely to be highly significant in the annals of education because it provides the perspective from which we can identify the aristocracy as outgoing, the meritocracy as prevailing, and egalitarianism as the mood of the future.

National statements of policy formulated in the 1950's support the prevailing meritocratic criteria for determining who shall have the opportunity for postsecondary education by phrases such as "...identify qualified youths of financial or cultural need with an exceptional potential for postsecondary educational training

and encourage them to complete secondary school and undertake postsecondary educational training" (Public Law 90-575, October 16, 1968, emphases added). But federal programs have also launched the beginning of an egalitarian era with programs for the disadvantaged which "are designed to generate skills and motivation necessary for success in education beyond high school" through the provision of special or remedial services for students "of deprived educational, cultural, or economic background or physical handicaps, [who] are in need of such services to assist them to initiate, continue, or resume their postsecondary education" (Public Law 90-575).

The emphasis of the 1960's was on access. The goal was to move young people toward traditional postsecondary education through supplying money, incentive, and remediation of past educational deficiencies so that New Students would have the same educational opportunities as traditional students. Partly because of the success of this effort in the 1960's, the task of the 1970's will be accommodation of education to the needs of students who gained admission through access programs. The emphasis will change from moving students toward higher education to moving education toward students. The 1970's has brought the realization that success at academic tasks in the past is not an infallible predictor of success in the future, especially when past

opportunities for learning have not been equal for groups of differing locales, ethnic backgrounds, and socioeconomic status.

The press is strong for an egalitarian philosophy of access to postsecondary education. Egalitarians maintain that anyone who has the desire to pursue further education should be helped to do so, regardless of economic resources and regardless of past academic achievement. If the meritocracy is ebbing and egalitarianism is on the rise, who will go to college?

The description is not quite accurate, but it is generally conceded that we have, in this country, a system of universal secondary education wherein young people who are physically and mentally able to attend high school do so. In reality only about 80 percent of the young people graduate from high school. If we assumed that universal higher education existed when it became as common as high school graduation is today--i.e., when 80 percent of the high school graduates continued their education--then we might construct a hypothetical egalitarian form of Table 1, wherein every SES-ability cell had an 80 percent postsecondary education attendance probability. Eighty percent of those in the top quarter on both SES and ability would continue their education, and 80 percent of those in the bottom quarter on both indices would also continue in some form of post-secondary education.

Table 2 shows the reservoir of potential New Students to higher education. It is obtained by subtracting the percentages in each cell of Table 1 (the reality) from 80 (practical egalitarianism).

TABLE 2

The Hypothetical Reservoir of Potential Students for the Attainment of Egalitarian Postsecondary Education

Ability	Socioeconomic Status			
	1 - Low	2	3	4 - High
Male				
1 - Low	32	25	40	15
2	23	22	11	1
3	6	3	1	--
4 - High	--	--	--	--
Female				
1 - Low	41	33	25	20
2	40	36	16	4
3	18	12	3	--
4 - High	11	3	--	--

Source: 80 percent minus the percentage in each cell of the 1967 ETS Growth Study data presented in Table 1.

Quite clearly, most of the New Students would come from rows 1 and 2--the lower half of the class academically. There would be almost no additional males from the upper half of the class, but there would be a fairly large number of women who stand in the top half of the class academically--almost all of them from the lower half of the socioeconomic scale.

Who will go to college? New Students to higher education will be students whose performance at academic tasks in the past has been below average. Low academic ability, as that ability is traditionally nurtured and measured in the schools will be their distinguishing characteristics. We need to turn our attention to the complicated problems of designing educational programs that will educate those who have been relatively untouched by instructional programs of the past. Institutions of higher education are not now prepared to teach New Students. Nothing in our experience of designing educational programs has prepared us to think about whether the present meritocratic goals--i.e., high academic achievement--are compatible with egalitarian access. Do we plan to admit everyone, but graduate only those who meet meritocratic standards? Perhaps the place to start conceptualizing the enormous task before us is with achieving a better understanding of the characteristics of New Students.

A research description of the abilities, attitudes and interests of New Students, with emphasis upon suggestions for the design of appropriate educational programs for New Students is underway with the support of Educational Testing Service, the College Entrance Examination Board and the Center for Research and Development in Higher Education, University of California, Berkeley. A very brief capsule profile of some characteristics of New Students is presented here. For purposes of this description as well as those of the comprehensive study, New Students are defined as those scoring in the lowest third of samples of high school seniors on traditional tests of academic aptitude.

Most New Students are Caucasians whose fathers work at blue-collar jobs. A substantial number, however, are members of minority ethnic groups. The great majority of fathers have never attended college and the expectation of college is new to the family. Those who constitute the New Student pool of high school graduates have not been especially successful at their studies in high school. Whereas traditional college students (upper third) have made A's and B's in high school, New Students tended to make mostly C's. Traditional students are attracted primarily to 4-year colleges and universities, whereas New Students plan to enter public community colleges or vocational schools.

Fundamentally these New Students to higher education are swept into college by the rising educational aspirations of the citizenry. For the majority, the motivation for college does not arise from the anticipation of the joy of learning the things they will be learning in college, but from the recognition that education is the way to a better job and a better life than that of their parents.

Most educators and legislators have become sensitized to the failure of schools in minority ethnic neighborhoods to provide adequate academic foundations upon which young people can build college educations. But in a recent study sponsored by the Carnegie Corporation, Binzen (Carnegie Quarterly, 1970) found that Kensington, a blue-collar community that is 99.7 percent white, has some of the same problems.

> Kensington is a community in crisis.... In many ways it looks, thinks, and acts like so many of the Negro ghettos festering in American cities. Its educational, political, social, and economic problems are almost as great as those found in the black slums. It, too, has failed to solve these problems, and failure has made it sullen, surly, and suspicious [p. 2]....
>
> People forget that, in the metropolitan areas, twice as many white as nonwhite families live in "official" poverty, and of course many Whitetowners don't quite qualify for that governmental distinction. They are poor but not poor enough to get help. Usually earning from $5,000 to $10,000 a year, the Whitetown husband and father works hard as a truck-driver or turret lathe operator or policeman or longshoreman or white-collar clerk--perhaps at more than one of these jobs--to buy and hold on to his fourteen-foot-wide house and new color television set. [p. 1]....

Some of the immediate implications for federal programs that result from this influx of New Students are apparent from a knowledge of SES and ability characteristics alone. Among these are the following:

1. The majority of young men now entering public community colleges will require some form of "remedial" help before they can meet the traditional standards of college. Seventy-two percent of the men entering public community college in the fall of 1970 made below-average grades in high school (ACE, 1970).
2. Female New Students are coming from the lower socioeconomic classes, but generally speaking women attending community colleges made average grades in high school. Their greater need is financial assistance. Women entering public community colleges are more worried than men about financing their education (CGP, 1970). Because part-time jobs and loans are more difficult for college women than for men, these young women will be placing increasingly heavy demands on the financial resources of colleges.
3. It is the opinion of this author that highest financial priority should now go toward developing effective educational programs for New Students. The access

programs of the last decade have been, by and large, very successful. If after placing postsecondary educational opportunity within reach of these young people, we offer nothing more than further frustration and further opportunity for failure in educational programs that are inappropriate for the students and the times of the 1970's, then equality of educational opportunity is a hollow victory.

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THE DESEGREGATION/INTEGRATION DILEMMA IN HIGHER EDUCATION: IMPLICATIONS FOR RESEARCH FROM MINORITY STUDENT EXPERIENCES*

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Political and legal forces are pressing for the demise of the racially dual system of higher education as it has existed over the country. The nation's traditionally white colleges and universities, essentially liberal in nature (and probably fearful of loss of federal funds), appear to be moving with vigor to add Blacks and other minorities to their student bodies. Among traditionally black institutions, with the exception of a few (generally new) black separatist colleges, counts are made each fall of the numbers of white students, and the results are proudly spread in the local press.

The efforts of the separate insitutions to attract students of atypical racial origin vary, of course; yet, conversations with admissions officers frequently suggest unusual efforts. At one noted traditionally white Southern public liberal arts university, "integrated" for fifteen years, black recruiters have now been added to the admissions office staff, over three-fourths of the

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* Prepared for the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives.

travel budget assigned to that office for recruiting was reportedly used for seeking black applicants last year, and two separate visits were made to every predominantly black high school in the state. A prestigious private university assigned, on a per-student basis, approximately seven times as much of its financial aid resources to black students as it did to white students. A small private church-related college used its black students to interview prospective black applicants, and conducted almost 900 interviews in one recruiting season -- a number representing more than half their total enrollment.

Yet, such efforts as these should be evaluated by the results they produce, rather than by the magnitude and cost of the activity. In the case just cited of the public university, the vigorous recruiting efforts, directed at a high school senior population of some 20,000 Blacks, resulted in about 250 completed applications but only 131 enrollees, representing less than three percent of the total entering freshmen at that institution. The admissions officer at the private university complains that inadequate financial aid resources are a major factor in keeping his proportion of black students down to less than four percent of the student body. And, the budget officer at the small private institution calculated that some 72 hard-sell interviews were needed, on the average, to produce one black student signed, sealed, and delivered.

Desegration guidelines and compliance requests directed by Federal sources to higher education institutions have made some suggestions toward improving the situation, involving such activities as selective recruiting, and attention to black athletes and black coaching staffs. Confronted with the enormity of the problem, one wonders if these kinds of efforts are enough.

That progress has been slow is attested by data compiled by the Office of Civil Rights on race of undergraduate enrollment. For example, in the ten traditionally white public universities in one mid-South state noted for its relatively moderate climate on integration, only 1.6 percent of the undergraduate enrollment in 1968 (the date of conduct of most recent published survey) was non-white; private white universities and colleges in the same state that year show even lower proportions of non-whites. Whites in the traditionally black institutions in that state in 1968 represented 0.6 percent and 0.1 percent of the undergraduate enrollment in public and private institutions respectively. Local surveys in the current year show some improvement, but nothing dramatic by any single institution or group of institutions.

Therefore, it seems that neither the traditional freedom of choice

of college, as opposed to the principle of assignment in public lower education, nor vigorous efforts by the institutions, nor federal pressures have removed the color line in institutions of higher education to any degree. It is the essential thesis of this paper that the real and subtle barriers to equal access to higher education are strong and pervasive, and that ambitious programs of research -- at the national, state, and institutional levels -- are needed toward determining what new forces may effectively produce a reasonable integration of higher education, and beyond that, may provide reasonable opportunities for honest and societally useful personal and intellectual growth and development.

Is Selectivity in Admissions a Deterrent to Desegregation?

One factor that must be recognized at the outset is that American higher education, though characterized as sufficiently diverse in content and academic/intellectual level as to provide a wide range of tolerance for individual differences, is a hierarchial system from institution to institution. Some institutions are blessed with more applicants than spaces, and maintain vigorous efforts to preserve this situation in the name of "quality"; the traditional criteria used by the gatekeepers or admissions officers are indices of past academic performance and scores on standardized tests of academic ability and achievement. Natural forces of institutional development, and the focus by the gatekeepers on

the traditional yardsticks (past grades and scores on tests) have resulted in a situation where in most states the lowest ranking admitted freshman in one institution is higher on the admissions indices than the highest ranking entering freshman in some other institution. That this practice has some justification is shown by thousands of studies finding relationship between standings on admission indices as freshmen and academic survival in a particular college or university; that supply and demand factors color what levels of promise are required in any particular institution is shown by the variation among institutions in the average level (and range) of students accommodated. The problem for black students is too well known; on traditional tests they perform at significantly lower levels than do white students.

The major purpose of this paper is not to deal with the question of the use of potentially restrictive admissions criteria with minority groups, or with the validity of these criteria for cultural minorities. These questions have been frequently raised, and thoroughly studied; implications for continuing or expanded research are relatively barren. It can be said that, in the public colleges of the state wherein we have focused our recent series of investigations, there is evidence that admissions officers in traditionally white institutions are accepting much lower levels of performance on tests for black applicants than are required for white applicants (although higher records of

performance in secondary school are typical for admitted black students). Second, there is no evidence that tests have less validity for predicting academic performance of black students than they do for white students; in fact, applying white student prediction formulas, and hence white-based standards, to black applicants tends to give higher ratings of promise than they achieve.[1]

Thus, it is confidently predicted that tests and the gatekeeper function are not particularly relevant targets for inquiry or restructure. Conventional tests are constructed by a search for items that discriminate between those who later do well in conventional programs employing the usual teaching strategies, vs. those who do not do well; it is difficult to locate cases where black students have been denied admission because of test scores (although those with high scores are substantially wooed by armies of recruiters), and it is easy to demonstrate that admissions officers have opened doors to lower scoring black applicants.

The Real Issues in Desegregation/Integration of Higher Education

The December 15, 1970 draft of the "Preliminary Plan" for the proposed National Institute of Education cites as a national

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1 A summary of the main findings of research concerned with the applicability of standardized tests to black applicants for college is given as an appendix to this paper.

priority the "increased equality of educational opportunity,"[2] and sketches a program element concerned with problems of the disadvantaged in the context of the preschool and the public school periods.[3] The focus of the present paper is not only on the higher education period, but also on activities of direct concern for, and subject to implementation by, higher education institutions and agencies. The significant issues for higher education seem, to this writer, to be two-fold:

(1) The problem of desegregating higher education must be viewed at least in part as a matter of changing those subtle but real social and personal forces that prompt cultural minorities in the self-selection situation to apply, if at all, principally to institutions that traditionally accept them; toward broadening perceptions and vistas of higher educational opportunity; and, toward improving access for minority students;

(2) The problem of integrating higher education must be viewed as a matter of the effective accommodation of atypical students, through the creation and provision of learning environments that are conducive to honest growth and development for cultural minorities, whatever their deficiencies.

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2 Levien, R. E., National Institute of Education: Preliminary Plan for the Proposed Institute. Washington: The Rand Corporation, Dec. 15, 1970, p. 23

3 Ibid., pp. 57-60

"Atypical" Students: What We Believe They Are Telling Us

The "atypical" student, or the student in a racial minority for any particular campus, is a new phenomenon. As an aid to agencies and institutions anxious to increase the proportion of atypical students, we decided in 1969-70 to seek out such students on a number of campuses, and discuss at length with them separately and together why they had chosen their particular colleges, what expectations and anxieties they may have had prior to enrollment, what they had found and experienced. The answers to these questions from even those few on the leading edge of the higher education desegration movement might, we felt, be helpful in suggesting more effective recruiting and educational treatment methods.

Our information on the "atypical" student in the traditionally black college -- in this case, the white student -- is scanty. Our concern was with entering freshmen, in the usual age range; intensive searches for such students were made in all public and private black colleges within the mid-South state that was the target for our inquiry. But, as we closed in on campus after campus, with traditionally black colleges in the state enrolling almost 25,000 students, we found only five individuals -- two athletes, a Puerto Rican, an anxious and hostile young man who ran away, and a student from a midwestern state who had not realized

the college was black until he came for registration, and who was too proud to return home. The others were adults from the campus neighborhood, usually in part-time study; faculty spouses; graduate students (generally teachers or students who had experienced difficulty in getting admitted to more selective professional schools); or exchange students.

Our conversations shifted to the faculty and administration. This produced some inventory of suggestions: achieving inroads by evening courses in off-campus buildings associated with white traffic or in white neighborhoods; greater attention to sequences of courses emphasizing local salable vocational skills; greater efforts to keep militant black students under control, or to avoid by whatever means public display of strife that would alarm parents of prospective white students; the attraction of white townspeople to campus cultural events, toward showing the college as a community property rather than a black property; and, upgrading of programs to make them more attractive to Whites.

Thus, it would seem that within the state studied, progress in desegregation of the traditionally black institutions is not as great as the very modest gains that public records would indicate have been made, and that the attraction of white students is a particularly difficult task. It would seem that ambitious

programs of research and development should focus on such problems as the change of college image; the search for new programs (perhaps in such areas as community service) that would be equally attractive to Whites; studies of information imparting and more effective recruitment strategies; or, perhaps, experiments in the creation of totally new institutions that could start in a color-free tradition.

Our attempts to locate and enter into substantive discussion with black students on traditionally white campuses were more successful. Heavy use of black professional staff was made and, we acquired a corps of black upperclassmen from the thirteen target institutions, commissioned them to work with us, and trained them in interviewing and reporting methods. These students returned to their campuses, to conduct and report formal interviews of more than 160 freshmen. We also invited groups of black students from a larger number of institutions to day-long discussions (electronically recorded) among themselves and with black professional staff. We believe the strategy in asking Blacks to enter into discussion of interests and problems with each other, while organizationally maintaining a low profile, was successful in preventing the vehicle of the research project from being used as a platform for preserting preconceived views and demands for "party-line" solutions -- that is, the information exchanged among themselves seemed personal and sincere, and an unmistakable integrity of feeling and conviction came through in most instances.

What, then, did these students tell us or exhibit to us?

With regard to reasons for choice of college, we detected in those black students entering the traditionally white senior colleges or universities a variety of creditable responses. Like black students entering black institutions, there was a restriction of geographic mobility; they chose colleges that were near their homes. A few noted that a nationally ranked black athlete called attention to the fact that the institution was for all the people. Many of the enrolled students stated that through a good offer of financial aid they could comfortably afford to study at that institution; some had obviously shopped around and had taken the best offer of aid they could find. As has been found with white students, the guidance counselors in the secondary schools seemed to have little recognized impact on the individual's choice of college, although teachers were frequently cited as influential, particularly those in English and mathematics.

At the same time, some reasons frequently given by white students were understandably missing -- that is, parent or relative an alumnus, or choice of the institution by a close friend. There was no strong evidence of parental involvement in the choice of college.

But more important than these considerations was a host of underlying themas that may be designated as the "white is good" syndrome, or the relatively blind association of quality with the white institution. Permeating many of the discussions were statements that selection of a white college was influenced by a desire to get the best education -- sometimes the best general education, or, more frequently, the best education in a specific field -- and there was the seemingly natural assumption on their part that this ruled out Negro colleges. Sometimes this was stated directly; sometimes in other ways (e.g. "It doesn't mean anything to flunk out of a black college; you know you've failed when you flunk out of a white college").

That this "white is good" syndrome -- a label our Blacks would surely object to -- permeates the culture and activities in the predominantly black high school or black community is the finding that when it becomes known that a black senior has been accepted by a white college he is given a kind of superstar status: his name is posted conspiciously; he is presented, coat and tie, at student assembly; he is perceived by peers as one who really made it.

Another frequent thema was that the individual black student has a high level of professional aspiration in which education

is seen as instrumental to entry. One said: "I want to be an engineer, and I'll be competing with Whites; I want to be ready for that." Another from a predominantly white high school said: "I want to be a journalist, and my English teacher said the best school of journalism was at the (white) University." In this context, it should be noted that other studies indicate that most of our interviewees had achieved exemplary high school records, whatever their admissions test scores. In short, we believe we were dealing with young people who had experienced academic success, and who could consequently shoot high comfortably. The absence of perception of quality, among our subjects, in black institutions is somewhat alarming (incidentally, almost two-thirds reported they had also applied to black institutions and had been accepted).

Our data do not permit any safe generalizations about the impact, on choice or aspiration, of prior experience in integrated vs. segregated high schools. For those blacks in four-year colleges or universities, a little more than half came from schools with at least token desegregation. It was clear, however, that few had experienced what they perceived as a close or personal relationship with white individuals or groups, and that our group contained few if any who had been active in racial disturbances in the schools or who had experienced trauma from racial unrest. Instead, some reported high hopes at the time of choice of getting away from any danger of ugly confrontation by moving to the "raceless"

white university setting, and many stated that in shooting for a role in a white or color-free world they felt they needed to and would learn how to "get along" with Whites.

Thus, our black students seemed at the point of college entry to be reasonably confident and unfearful; excited about their forthcoming opportunity to get a first-class citizenship; and open to color-free friends and culture. What did they find?

Our personal interviews were with freshmen toward the end of the first year; our group discussions were with sophomores, juniors, and seniors. The major, and most significant and undeniable, though surprising, aspect is that experience in the white senior college or university in most cases (there are some significant exceptions) seems to lead the student toward an increasing awareness of his blackness, toward an identity not with all people but with black people. One student, asked how he had changed since coming to college, put it simply: "I've become bitterer and blacker." What do their comments and reports indicate may be responsible for this turn-about?

Some comments indicated that a part of the "becoming blacker" phenomenon is the simple fact that blacks are an identifiable minority in the student bodies. One student said: "I want to sh . myself as a Negro more -- we are so few." Another said:

"It's nice to be around someone of your own race -- I don't know what I'd do if I was the only Black at this university."

Another contributing factor -- and, in any case, a major problem in its own right -- was the limited range of heterosexual social opportunity most Blacks found. On most campuses, black students reported unusual efforts among themselves to have their own place for informal social activities, or expressed great frustration at having to go back off campus to make the broader friendships white students found a natural on-campus benefit. They, like white students, see college not only as a period of preparation for adult work role but also as one where heterosexual activities are crucial to personal growth and satisfaction. On the campuses, heterosexual social life and institutionally organized or sanctioned events -- e.g., the big dance -- are conspiciously white. One black student, a popular athlete, placed the critical point of self-questioning at a party weekend: "I wanted to go with my (white) friends, but I couldn't get a date -- and suddenly I found myself asking, 'What will they think if I try to dance with their white chicks?' Then I thought: 'Will they be insulted if I don't?' It ended up that I got so upset I got sick and couldn't go anyway."

Another observation was that many of the black students experienced

events in which they perceived a racial prejudice directed toward themselves, with resulting alienation from students i· ge..eral and refuge among the more separatist black upperclassmen. One Black, a valedictorian in a white high school with token integration, came to campus for the first time two days early to soak up the new dreams of fraternity and eventual success. He reported a late evening stroll the first evening, and confrontation by a carload of Whites of student age who stopped and yelled: "Hey, Nigger, what are you doing here?" Suddenly, he reported, the campus didn't seem as safe, and he ran to his room and remained locked in without food until registration. Although he reported he felt better later, the event was traumatic and had placed him on guard. Another black student was convinced that indignities of freshman hazing he had experienced personally were overt attacks because of his color. At the very least, our Blacks frequently seemed to appear particularly sensitive to any rebuff in general in give-and-take with white students; at most, there probably were some genuine slanders that could only serve to call attention to prejudice where they had least expected it. One thoughtful student observed: "They (white students) are half-way prejudiced....just getting so they can partially conceal it." Another, strangely but plaintively enough, said: "The white students here are friendly to me only because I'm Black."

The data seem to suggest that some of the problems black students experience are rooted in differences of background and experience between the members of the white and black subcultures. Many more of the black students may have held and needed to hold jobs; values and interpersonal styles are known to vary as a function of socio-economic background. One student expressed his reaction this way: "The white students here are a bunch of pampered, prejudiced punks." The impartial observer can see that boys from the poor side of town could only view the majority culture of peers in college as panty waists. Another black freshman said: "I've become cold, hard, cruel, calculating, prejudiced, unfeeling, (obscenity meaning blatantly deceptive); I have to be just like the Whites in order to survive here." A third observed: "To come to (name of University) for a white man means a continuation of the fantasy they call life; but to a Black coming here, it is an awakening to the deficiencies of our society and to the great necessity for change."

In spite of the fact that black students in the target institutions in general are known to have lower academic averages and higher attrition rates than their white student counterparts, we could detect no groundswell of feeling of oppression by academic demands, or unusual concern about performance. Most seemed to have expected

that academic success would require hard work (although most had said they had had no information before entry as to how hard they would have to work); and, although this perception did not change with experience in college, we could seldom detect dissatisfaction with grades, or apprehensions about not being able to retain good standing, or frustration from the amount of effort required. Recommendations for easing the adjustment of future generations of black students centered on the interpersonal elements of college life, not on tutoring or special remedial efforts. That the difference in levels of performance was recognized may be attested by the frequent observation that the Black with outstanding grades is of the white establishment, and a poor recruiting prospect for active membership in the campus black brotherhood. A few felt some instructors were prejudiced, but more reacted to the unexpected mediocrity they had found in some of their teachers.

Feelings about black courses and black faculty seemed to echo, but only to echo in our context, the well-known demands. One student noted that in a hard-won course covering work of black poets, the black students dominated the discussions, yet the white students at written exam time got the good grades. Many seemed to feel that their new experience with Whites in itself helped them to identify unique aspects of their own cultural heritage.

On the matter of supplementing the one or two black instructors on most of the campuses with additional black instructors, the black students -- particularly the upperclassmen -- seemed to feel that the college could only be a white institution; and, that black faculty must choose either to become part of the establishment, or to become part of the black student sub-culture, losing their utility as their black spokesmen either way. The answer, then, was "more black instructors, of course." But the students' outlook for changes they felt needed if more black faculty members were obtained was bleak.

The black upperclassmen in particular seemed to hold strong perceptions of the college administration as the epitome of white establishment and th. .tore natural enemies. One student noted that his university president, whom faculty and other administrators in the area regard as most liberal and creatively and honestly dedicated to all students, was an impossible and prejudiced opponent: he had been asked by the black student group to designate a place and to provide $3000 to decorate that place for black students. "You know the President runs the college, but he hedged with all this (nonsense) about budget and trustees.... we hit the white businessmen in town, and had our $3000 in two days, and then we made him give us a room in the student union by sitting in his office until he did."

Such instances can be interpreted as selfish requests for special consideration by immature militants, who use improper means to get what they want; or, as evidence of a reasonable student naivety about the total responsibilities of an administrator, and the ways budgetary and other decisions must be made in a university setting; or, as the black students interpret it. The significant observation is, the writer feels, that as the progressive polarization of black students occurs, the task of responsible university officials becomes more difficult; and, that as particular needs become more acutely experienced by a particular sub-culture, the more that sub-culture is solidified and the more it may regress to whatever characteristic ways within the sub-culture redress is achieved.

Earlier and more biased interpretations of the black students vis-à-vis administrators were held by the writer until he entered into a long discussion with an aggressively militant black student leader with whom he seemed to have achieved special rapport. This student documented at great length the special efforts at his college to keep athletes academically eligible, and to provide special privileges that were denied other students. Yet, he reported, the college and administrators professed publically the primacy of the academic and humanitarian goals to which that college was committed, and their special interest in increasing and accomodating

the ranks of black students on campus. The black students, it would seem from all our evidence, are not unaware that federal pressures, rather than desire to serve them, may have bought them a place; and, that the American university has, and cannot hide from students who feel discriminated against, actual practices which run counter to cherished philosophies.

Within the data mass produced by the reports of interviews and recorded discussions, the writer can find no evidence that the black students see any special instructional efforts by faculty, or any special programatic treatment, that is to them worth noting. Similarly, they seem to attribute no facilitation or easement of black student problems to white students. This may, of course, be a matter of limitations of awareness or of what they feel appropriate to discuss, or a function of all the forces that increase their distrust and dislike of Whites (more than one-third of the interviewees stated, when asked if their attitude toward Whites had changed, that they had become more distrustful or hostile).

Instead, there seemed to be a rather remarkable recourse either to becoming more independent, or to deepening ties to their black brothers. The resulting solidarity appeared, in the reports of activities of movement groups, to result more in group effort to help the black newcomer and each other survive the academic and social

rigors than to provide a vehicle for agitation or presentation of non-negotiable demands.

It was noted earlier in this paper that there were exceptions to the phenomenon of increasing polarization as a correlate of experience on the white campus. Very occasionally, these were individual -- e.g., the student with superlative academic record. More frequently, the exceptions were institutional.

The striking exceptions were the students from the (four) two-year public institutions. Their representatives sat almost open-mouthed in the groups as the four-year college representatives talked. One, from an institution with only some eight percent of the student body black, stated expressly that before he had sat in on the discussions, he had never thought of his two-year college as predominantly white. This feeling permeated the attitudes and reports of the students from the community colleges.

Consideration of the many possible explanations, made in the light of the data, suggests to the writer that one critical factor may be the community and non-residential nature of these institutions. In a real sense, the black students never leave home. The heterosexual social problems are solved by community rather than college resources. Another factor may be that these institutions

are more frequently tuned to accommodating vocationally-oriented students, and that the aspirations of the black (and white) students entering are less complex and more effectively facilitated by the educational program. Another may be the remedial orientations, and the absence of discrepancy in test or past performance levels between white and black enrollees. Whatever the reason, the absence of strife, and the degree of affiliation by the black students with their institution, is rather remarkable, particularly against the common observation of a decade or more ago that prejudicial activity against Negroes was more likely to be exhibited by Whites who were in fact threatened by black academic and occupational competition.

Confronted with such speculations, however, some of the black representatives of the senior colleges and universities could not agree. Instead, they tended to attribute this to the absence yet of the emergence of black student leadership. "Sooner or later," one student predicted, "a leader will rise up among them, and then you'll see what we've been telling you."

The finding, if the writer's interpretation is correct, of a kind of institution where integration, rather than desegregation, appears to be occurring, can be viewed as comforting by many who are concerned with a new social order dedicated to equality of

opportunity. Yet, that the numbers of Blacks in the more senior institutions that provide intellectual leadership for the nation are so few, and that their experiences take on the colorations noted, strongly imply that there is much research, development, and innovation ahead if national interests and the real needs of all our citizenry are to be served.

The initial postulates presented in this paper -- that some critical barriers to equal access to higher education in our society are subtle, and that new kinds of instructional strategies and learning environments must be achieved -- would seem to be affirmed.

Federal involvement in equal opportunity must, it would seem, go beyond legal coercion, and beyond massive financial support of individuals and institutions as they pursue their usual goals in their characteristic ways. The proposed National Institute of Education must, as a federal agency, assume some leadership role in implementing research and developmental activity directed toward:

- The more effective pre-college preparation of the disadvantaged by our public schools, through program elements such as those already proposed in the Preliminary Plan.[4]

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[4] Ibid., pp. 57-60.

- The more effective recruitment of disadvantaged to higher education opportunity, through studies of what factors motivate disadvantaged to choose "atypical" higher education settings, and through showing how the findings may be implemented.
- The more realistic orientation of disadvantaged to higher educational opportunity and to the demands higher education will make on them.
- The more effective educational, social, and personal treatment of "atypical" students in institutions of higher education, toward facilitating the integration of these students into the mainstream of college and American life, in modes feasible to employ in our higher education settings.
- The determination of better administrative and management strategies for higher education in providing for the needs of disadvantaged students as well as of other students.
- At the institutional level, the effective resolution of the more difficult problem of helping the traditionally black institution to become an equal partner in the national higher education enterprise.
- The more successful infusion of programatic solutions into a kind of American institution hide-bound, to a remarkable extent, by its belief in its tradition, self-sufficiency,

independence from outside pressure, and capability to solve its own problems; and, at the same time, the better mobilization of the nevertheless rather remarkable resources of American higher education institutions to aid in achieving the programatic and societal evolution necessary to make equal opportunity a reality.

APPENDIX

SUMMARY OF RESEARCH ON VALIDITY OF
TESTS FOR PREDICTING ACADEMIC PERFORMANCE
IN COLLEGE OF CULTURAL MINORITIES

The question of the meaning of scholastic aptitude test scores for Blacks or other cultural minorities is not new and a number of relevant previous research studies are available, either as part of the published literature or as unpublished institutional studies. The writer feels it is safe to say that the following conclusions, briefly documented here, tell a major story:

1. On scholastic aptitude or achievement tests, Negroes at a point permitting the beginning of college training tend to score significantly lower than Whites.

This fact is too well known to require documentation; a recent relevant statement, however, is that by Kendrick (1968), who has estimated that "not more than 15 percent and perhaps as few as 10 percent of Negro high school seniors would score 400 or more on the verbal section of the SAT (Scholastic Aptitude Test of CEEB). Only 1 or 2 percent would be likely to score 500 or more." It is indeed this fact that is the pressure, if not the justification, behind current black student demands for abolition of test barriers. For, if tests are indeed used to screen applicants, more Negroes than Whites will be screened out.

2. Published studies of the ability of SAT to predict grades of black students in predominantly Negro colleges, however, show

> that SAT is as valid in this kind of situation as it is for Whites in predominantly white institutions.

Typical of studies reporting this finding is one by McKelpin at North Carolina College, who reported (McKelpin, 1965) in his study of SAT and HS grades for predicting (black) students' performance at his institution (underlinings in original):

> The predictive validities based on the data for commonly used preadmission variables are as high as those usually reported for college freshmen.....the SAT scores account for about 60 percent of the variation in the grades explainable by the data from the preadmission variables... when first semester grades are the criterion, SAT scores give a fair appraisal of the developed ability of students entering (predominantly Negro) colleges.

It is true, however (probably because of the gross differences between racial groups noted before), that the use of tests directed at lower educational levels than the entering college freshmen have seemed more useful with Negroes in some instances. For example, a recent unpublished paper by John Hills of Florida State University and Julian Stanley of Johns Hopkins (Hills and Stanley, 1968) is abstracted by the authors:

> The two subtests of Level 4 of the School and College Ability Tests (SCAT) for school grades 6-8, are shown to predict freshman-year grades in the three predominantly Negro coeducational colleges of a Southern state considerably better than did the Scholastic Aptitude Test (SAT), which was too difficult for approximately one-third of the enrolled freshmen. Relative improvement in multiple correlation for

> SCAT compared with SAT lessened when high-school grade average became one of the three joint predictors, apparently because high school grades of SAT-undifferentiated students supplied some of the missing intellective components.

> 3. Although relatively few studies have yet been done of the validity of SAT to predict grades for Blacks in integrated colleges, the available evidence supports the conclusion of no difference in the levels of predictive validity of SAT for Blacks vs. Whites in such institutions, but also that if white-based prediction formulas are applied to Blacks, these students as a group tend to perform below the predictions.

In the first sophisticated study of the predictive value of SAT for Negro and white students in three integrated colleges, Cleary (1968) summarized her findings:

> In the two eastern colleges, no significant differences in the regression lines (SAT predicting grades, Blacks vs. Whites within a single institution) were found. In the one college in the southwest, significant differences were found, but it was the Negro scores which were over-predicted. Thus, in one of the three schools, the Scholastic Aptitude Test was found to be slightly biased, but biased in favor of the Negro student.

The 'bias' in favor of the Negro student in the Cleary study was a result of finding, in effect, that at one of the three schools, Negro students with a given SAT score and high school rank made lower grades than white students with identical SAT scores and high school ranks. Thus, if a predicted level of performance is used in selecting among applicants, Negro applicants selected would achieve lower actual performance levels than their white counterparts, though they would more likely be admitted.

A similar finding has been obtained by Wilson (1969), who has studied performance and other characteristics of black vs. white students in four College Research Center institutions. He concludes on this aspect of his data:

> An analysis of the relationship between Predicted Freshmen Grade (combining the Admissions variables--SAT-V, SAT-M, Achievement Test average), indicates that traditional admissions criteria tend to be at least as correlationally valid for black students as for entering students generally. There is moreover some evidence that predictions made on the basis of standard formulae may tend to overestimate the first-year performance of Black students in the several colleges studied.

Even more convincing are studies within the last year by Temp (1971) and the writer (yet unpublished). Temp collected data on black vs. white students in thirteen colleges over the country, and concluded: "If prediction of (...the grade point average in college) from SAT scores is based upon prediction equations suitable for majority students, then black students, as a group, are predicted to do about as well as (or better than) they actually do." The writer obtained similar findings in six public institutions in a Southern state.

A survey of the literature by Flaugher cites a review by Kendrick and Thomas (1970), and notes a host of studies -- Boney, (1966); Hills, Klock, and Lewis (1963); Roberts (1962, 1964); Stanley and Porter (1967); Olsen (1967); Cleary (1968); Morgan (1968); Munday

(1965); Thomas and Stanley (1969); McKelpin (1965); Funches (1967); Perlberg (1967); and Peterson (1968). These have involved SAT, tests of the American College Testing Program, and other similar college level tests - both separately and in combination with high school grades. Rather than finding in these any evidence of reduced predictive validity (than that typically found for white students) Flaugher notes that test scores predict as well for Blacks, and that in a large number of instances they provide better estimates of performance in college than do high school grades -- a finding that may reflect the kinds of secondary schools that as recently as several years ago most Blacks attended.

Flaugher also notes a number of applications to prediction of job performance -- Tenopyr (1967); Grant and Bray (1970); Campbell, Pike, and Flaugher (1969) - where tests are found to overpredict, not underpredict job performance when applied to non-Whites. Tenopyr (1967, p. 15) calls it "unfair discrimination (which) however, would favor, not penalize, the Negroes." Flaugher adds the explanation afforded by Rock (1970) that motivation toward achievement in college is typically a white middle-class phenomenon, and that non-Whites may not be as likely "to utilize to the maximum what aptitudes they possess." There may also be problems of less adequate preparation, poorer study skills, and the intrusion of anxieties that may arise from being in a real minority in the majority college culture. All this recent evidence indicates, as

in the first Cleary study that the use of SAT or similar tests may lead to accepting Negroes who are poorer academic risks than lower-scoring Whites who may be excluded if similar standards are employed. This is not to state that such admissions should not take place; rather these findings are cited to show an absence of evidence for the frequent claim that tests are biased against Negroes. For, if there is a bias, it is in the social and educational system in which these students were reared.

> 4. If one attempts to make a case for bias in academic tests because certain subgroups of the population make lower scores than others, the evidence points to deficit as a result of cultural disadvantage rather than as a result of racial origin.

Cleary and Hilton (1968) studied performance on the Preliminary Scholastic Aptitude Test for grade 12 students in integrated high schools. When Blacks were compared with Whites of similar socioeconomic levels, they concluded:

> From the bivariate plots of sums of item scores, it was apparent that there were few items producing an uncommon discrepancy between the performance of Negro and White students. It must therefore be concluded that, given the stated definition of bias, the PSAT for practical purposes is not biased for the groups studied.

> 5. Experience with special remedial programs for high-risk students, (e.g., students whose test scores indicate high probability of academic failure), or attempts to improve test scores (and grade performance) by special coaching, seem to indicate that at the very least unusual efforts will be needed to improve academic performance.

For example, after reviewing a large body of the literature on remedial education in the community junior college, Roueche (1968) concludes:

> The large majority of students who enroll in remedial courses fail to complete those courses satisfactorily and are doomed to failure or are forced to terminate their education. In one typical California public junior college, of the 80 percent of the entering students who enrolled in remedial English, only 20 percent of that number continued on into regular college English classes.

In a study of the effect of well-contrived and intensive instruction (though of short term duration from 4 to 6 weeks) in the kinds of cognitive tasks involved in scholastic tests, Roberts (of Fisk University), and Oppenheim (of Educational Testing Service) found (Roberts and Oppenheim, 1966) with students with inadequate instruction in the past that "it does not seem reasonable to expect that similar short term instruction given on a wide scale would be of significant benefit to disadvantaged students."

6. From institution to institution, and from year to year, the specific validities of preadmission indices will vary.

This is the matter of widespread experience; it probably results from a combination of factors: differences in curricula, heterogeneity of students, difference in institutional evaluational styles, etc. (This matter assumes added importance in the present context, however, for it is reasonable to assume that if an ability-free system of instruction were developed, then our

present conventional tests of ability would not be relevant to predicting success in that system.)

7. Among senior colleges and universities over the country or in many state systems, the traditionally black institutions tend to have students of lower test and high school performance levels than are generally achieved by black students attending traditionally white institutions; on tests and performance indices however, the means of some institutional groups of black students are higher than the corresponding means of some other institutional groups of white students.

No published reports of this pattern in higher education are known, although it has been noted in the public schools within state or large city systems. (Documentation for a state system of higher education will be available shortly in a report in preparation by the writer.) The major implications are two-fold: First, there are traditionally white colleges where many more black students than apply would not appear, from preadmissions measures, to be at a competitive disadvantage -- although,these are smaller, frequently private, schools that are not as active as others in recruiting black students. Second, the traditionally white institutions are nevertheless eroding the top of the black talent pool, if talent is measured traditionally, and many traditionally black institutions will shortly be able to demonstrate the effect of lower levels of talent than they have previously enjoyed.

* * *

What may be drawn from these conclusions, if they are indeed essentially correct? The writer feels strongly that further exhaustive study of our present tests and potentially restrictive admissions procedures take time, energy, and, more importantly, attention away from the real issue. That is, we need in higher education to focus instead on the study of curricular, instructional, motivational, and total educational environment strategies that may ease or void whatever cultural disadvantage exists, and that may permit real and rewarding learning experiences for these students. Then, research involving tests should be directed not toward proving that our current measurement procedures are biased or are not biased, but rather toward creating new measures that may facilitate the identification of what settings and what instructional strategies are effective with what kinds of students -- with behavioral objectives set in terms of the needs of society, not in terms of the seeming limitations of certain identifiable sub-groups.

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STATEWIDE ASSESSMENT: ITS FUTURE AND POTENTIAL FOR EDUCATIONAL REFORM*

Henry S. Dyer and Robert J. Solomon

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When one considers the faith which Americans place in education, it is amazing that the concept of statewide assessment is such a relatively new development. From the beginning, Americans have seen education as an instrument for social progress. "If a nation," wrote Thomas Jefferson, "expects to be ignorant and free in a state of civilization, it expects what never was and never will be."

From the beginning, too, and increasingly with each new generation, American education has become a public (and in this sense, political) enterprise supported by a complex body of laws, particularly state laws, designed to give social sanction and encouragement to education, and supported by large and increasing amounts of public funds, particularly state and local funds. And as our concept of a democratic society has expanded and our needs as a society have multiplied, so too have our expectations with regard to who is to be educated and what is to be achieved.

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* Prepared for the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives.

In a society where education is everybody's business, the adequacy of that system also becomes everybody's business. As Bressler and Tumin[1] have observed, "The high visibility of the educational system and its governance, which underlies the public accountability of that system, also makes possible the constant confrontation...by relevant publics, such as parents and employers, of the "outcomes" of that system, as they personally encounter those outcomes in the form of their children and their employees."

If Americans today were satisfied with their society, if they were united in their perception of social priorities, and if they felt reasonably secure about their power to shape and control the future, there would probably be less concern today with assessment. But under the circumstances, it is not surprising that an institution which is so political, in the larger sense of that term--that is, how we govern ourselves to achieve our social goals--should come under increasing scrutiny from those on the left, the right, and the middle who feel a need to know what the schools are accomplishing, why they are accomplishing or not accomplishing, and how their accomplishments can be improved. In short, if education is the

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1 Marvin Bressler and Melvin Tumin, Evaluation of the Effectiveness of Educational Systems, Final Report, USOE Cooperative Research Project No. 6-2023, April 1969.

instrument of social progress then those who are dissatisfied for one reason or another with the present fruits of "progress" see assessment as a means to determine what has been happening and, ultimately, what should happen in the schools.

This is the motivation that underlay the Equal Educational Opportunities Survey (the Coleman Report), which is a landmark study in American education not for its findings, which are nevertheless noteworthy, but for the questions it asked. And it is also the motivation for the National Assessment project and for the recent efforts in the states of Pennsylvania, New York, and Michigan.

Also, although there are differences--for example, the Pennsylvania project is more explicitly tied to a carefully developed public statement of the goals of quality education--all of these statewide assessments are concerned with certain functional relationships among three sets of variables: student input, student output, and the environmental conditions affecting student learning and behavior. Although everyone involved in these projects appreciates the relative primitiveness of the present state of the assessment art and is aware of the measurement techniques that remain to be developed and refined, these projects are an improvement over earlier, cruder approaches.

One traditional approach has been to examine the quality of an educational system by taking a census of such things as the number of books in the library, the age of the school plant, the pupil-teacher ratio, the number of hours of per-pupil instruction, etc. The trouble with this approach to the assessment of system performance is that it traps too many people into confusing means with ends. It rivets attention on the instrumentalities of education without raising the question whether the instrumentalities--the books, the building, the teachers, the length of the school day--are having any impact on the intellectual, social, or personal development of students. (It is interesting to note parenthetically that opposition to the Coleman study increased as some schoolmen realized that this census-like approach was not to be its primary concern.)

Another traditional approach has been to measure the effectiveness of educational systems by comparing the average of the test scores of pupils in a system with some sort of national average or norm. Such statements as, "School X is better than school Y because the fifth-grade children in X are reading at grade level 6.2 while those in Y are reading at grade level 4.5," raise more questions than they seem to answer. It's no wonder that some of those committed to improving education for minority/poverty children perceive system-wide testing programs as a threat. It is unfortunate that many educators even now fail to grasp the fairly obvious principle that you cannot tell anything about how a system, or any phase of it, is functioning

by looking solely at what the students are like as they emerge from it. You have to have at least two additional kinds of information before you can even begin to know how well the schools are doing. You have to know what relationships may exist between the characteristics of the students as they come out of any phase of their schooling and the characteristics with which they enter that phase. You also have to know about the factors outside the school, in the home and in the community, that may facilitate or impede what happens in school.

Also, and this is the most difficult problem of all, you have to know, if you are to have any hope of improving the system, what goes on inside the system that is educationally productive. Ultimately, we need to be able to answer the question: What educational processes work in what kinds of schools for what kinds of kids?

In addition to providing the means to answer this ultimate question, there are several other purposes to which the assessment process itself should be addressed. These purposes may not be ends in themselves but they help to define the priorities for a statewide assessment and to suggest some conditions for the design and dissemination of results.

There are six main purposes that a statewide assessment should serve. Each of them is addressed to a different audience. They are, as

follows, not necessarily in their order of importance:

1. The assessment should provide the teachers and administrators in every school system with basic information for assessing the effectiveness of all the principal phases of their educational programs in sufficient detail to indicate the specific steps required for continually strengthening those programs.

There are at least two fallacies that make local education authorities resistant to having the state authority assess the performance of their schools. One is the notion that a state program of tests, questionnaires, and other measures, necessarily infringes on the freedom of local authorities to experiment with new curricula and methods of operation. The other is the notion that a local educational system can assess its own performance without any reference to the performance of other systems. Both notions are wrong. A statewide program of evaluation services, properly designed, does not have to interfere with the autonomy of local systems. At the same time, it seems clearly impossible for a local school system to secure a satisfactory reading on the effectiveness of its performance unless it has access to data that will enable it to compare its effectiveness with that of other systems that are operating in similar circumstances. The collection and organization of data to make such refined comparisons truly valid is no small task, but it is one that had better be tackled soon if we are to avoid the simplistic comparisons that now bedevil us.

Many school people are likely to be fearful that a statewide assessment program resulting in comparative performance data on the pupils in each school or school system will concentrate only on easily testable qualities and will thus leave out of account many factors in pupil growth (sense of personal worth, social adaptability, vocational effectiveness, etc.) which the schools rightly consider, or say they consider, important. This fear is not groundless, since measures of personal-social development which are both acceptable and efficient are hard to come by. It is for this reason that in working out the content of an assessment program the development of ways to measure these difficult-to-measure factors should be prominent in the planning effort at the very outset.

2. The assessment should provide the state education authority with basic information needed for allocating state funds and professional services in a manner best calculated to equalize educational opportunities for all children in all school systems of the state.

State authorities have the responsibility to provide a rational distribution of the funds and services tailored to the specific needs of each local school system. This implies a form of categorical aid but not in the usual sense of the term. Instead, the categories in which state aid is administered could vary from

one school system to another depending on what the assessment shows about the special problems of each school system. The emphasis would be on using assessment results as a basis for developing state funds and services so as to maximize the development of every child in the state rather than merely to provide that each child shall attain some minimum level of competence.

The next two are closely related.

3. The assessment should provide research agencies at both the state and local levels with data for generating and testing hypotheses concerning the improvement of all aspects of the educational process.

4. The assessment should provide every school system with strong incentives to experiment, under controlled conditions, with new and promising educational programs, materials, devices, and organizational arrangements.

Unless a statewide evaluation program encompasses these two purposes, there is the danger that the entire educational enterprise in the state will become stuck on dead-center. An important function of the data issuing from the evaluation program is to generate promising hypotheses to be tested through educational research. Thus, the

assessment system becomes an important, indeed an indispensable, stimulator of promising new educational ideas to be tried out by the schools. It is also an indispensable basis for determining the extent to which the hoped-for effects of innovative practices are being realized. No small problem, however, is the perennial need to find somehow more effective ways to tie back research findings to school practices.

5. The assessment should periodically provide the state legislature and the general public with readily interpretable information concerning the progress of the state system of education as a whole and of each local system.

The maintenance of sound educational programs requires the support of the citizens. Not only do they have a right to a periodic accounting of the educational benefits their tax dollars are buying; their support for more effective educational programs is likely to be somewhat less than enthusiastic unless such accounting is regularly forthcoming in terms that can be readily understood.

The sixth purpose, in our view, deserves the highest priority. We have left it for last because although it comes closest to what education is all about, it is the most difficult.

6. The assessment program should provide basic information for helping every student in the state assess his own progress through the educational systems of the state, so that he can become increasingly mature in understanding himself, his educational needs, and his future possibilities.

The prime focus of the assessment program should ultimately be on the individual student. It should give him the means for developing some order in his experience inside and outside of school. It should furnish him with the information he needs to work out his own personal and career goals and to chart his way toward them through the complex network of autonomous school systems that make up the state system.

A central fact of the educational enterprise that is often overlooked is the high mobility of the student population. Pupils--all pupils--are continually shifting from one teacher to another, from one grade to another, from one school to another, and from one school system to another. They are thus constantly having to adapt to changing educational environments, each with its own objectives, values, standards, and ways of doing things.

Since this is the case, one of the student's primary educational needs is for some intelligible indication of how he is doing and how he can

do better. He needs a means for evaluating his own learning periodically. The first concern of a statewide assessment program should be to supply this common source of information for every student in the state. The instruments and procedures for meeting this educational need of individual students are far from clear at the present time. But that the need is real and urgent seems unquestionable. The responsibility for meeting the need must rest with the state education authority if it is to be met at all.

The future and potential for statewide assessment are tremendous. So are the problems.

MASS HIGHER EDUCATION AND THE ECONOMIC BENEFITS OF A COLLEGE DEGREE*

Rodney T. Hartnett

Educational Testing Service

We are rapidly approaching compulsory higher education in America. Not in the legal sense, of course, but in the sense that various economic and social forces are funneling so many more secondary school graduates into some form of post secondary school education that for one not to attend college is becoming increasingly difficult. In 1960, about half of America's high school graduates went on to college; in 1970--just ten years later--this figure had jumped to 62 percent and within another decade will be at least 70 percent.[1]

There are numerous reasons for such an increase, but none is more compelling than the long-established relationship that has existed in this country between level of educational attainment and earning power. The mean income differential between those holding a college degree and those who have not gone to college is considerable. According to data gathered in the 1960 census,

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*Prepared for the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives.

[1] A Fact Book on Higher Education, American Council on Education, 1970, p. 70.7.

for example, an engineer of 45, holding a college degree, had an annual rean income of approximately $11,000, whereas engineers of the same age without a degree had an annual mean income of approximately $8,300. For salesmen and sales clerks, the differential was even greater, with college graduates earning an average of $11,000 as opposed to $7,500 for salesmen without a college degree.[2] Though these data are ten years old and the salary levels of both groups would be considerably higher today, the general nature of the salary differentials by educational attainment is probably essentially the same in 1971.

The sizable income differentials between those who hold a college degree and those who have not gone to college will come as a surprise to no one. Education has long been an accepted avenue to "the better life" in the United States, and while educators are anxious to point out that monetary values cannot be placed on education and that numerous non-monetary benefits are also important consequences, the fact remains that substantial and consistent financial benefits have been associated with educational attainment.

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[2]For details regarding income differentials by various fields over a period of years and estimated lifetime earnings by sex, race, selected occupations and years of school completed, see Income Distribution in the United States, Herman P. Miller, U. S. Department of Commerce, Bureau of the Census, 1968.

It is tempting to conclude on the basis of such data that going to college (or, more specifically, getting through college) is almost certain to result in a larger annual income for the individual. It is this very reasoning, in fact, that has prompted many young high school graduates, who otherwise might be disinclined to pursue more years of study, to attend college. Data from the American Council on Education's annual surveys of entering college freshmen (see Table 1) make it clear that many entering college freshmen do perceive the attainment of a college degree primarily in terms of an increase in financial potential. At all institutions of higher education combined, approximately 67 percent of the 1970 entering freshmen agreed that the chief benefit of a college education is that it increases one's earning power. Nearly 78 percent of the students entering a junior college in 1970 held this same view. On an actuarial basis, this opinion is supported by the evidence discussed earlier: college graduates, on the whole, do earn more. But at least two factors place severe restrictions on the generalizability of these data to individuals, and raise serious questions about the appropriateness or wisdom of the income differential argument as a primary reason to attend college.

Educational Attainment vs. Other Factors

First of all, it would be a serious mistake to overlook the importance that other personal characteristics play in determining

Table 1

Percentage of Entering College Freshmen Agreeing or Strongly Agreeing that the Chief Benefit of a College Education is That it Increases One's Earning Power

	1967	1968	1969	1970
All Institutions	56.0	57.8	53.6	66.7
All 2-year colleges	68.9	69.0	64.9	77.9
Public Universities	53.1	54.4	48.3	60.0
Private Universities	43.8	42.8	43.1	52.7
Public 4-year colleges	55.3	58.4	50.5	67.1

Source: National Norms for Entering College Freshmen, 1967, 1968, 1969, and 1970 issues, American Council on Education.

job success. As Levin and his colleagues suggest, "In all likelihood, attributing the gross improvement in an individual's potential lifetime opportunity to higher educational attainment probably understates the effects of the other traits of persons who receive more schooling."[3] Intelligence, motivation, ability to "get along with others," --these traits and others are also important ingredients of occupational success, and are also related to academic attainment. A great deal of research has attempted to determine what percentage of the income differential between college graduates and those who have not attended college is due to higher educational attainment alone, and what percentage seems to be attributable to some of these many personal factors. As Levin et al. point out, nearly all the studies on the subject do show evidence of a significant effect of educational attainment that cannot be accounted for by differences in these other personal characteristics. But just how much is due to schooling and how much to other factors is still not clear. One investigator, for example, estimated that 60 percent of the income differentials that appear when men of similar age are classified by years of education actually is the result of education and 40 percent the result of other factors.[4] Numerous subsequent

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[3]Levin, Henry M., Guthrie, J. W., Kleindorfer, G. B., and Stout, R. T., "School Achievement and Post-School Success: A Review," Review of Educational Research, 41, 1 (February, 1971), p. 2.

[4]Denison, E., The Sources of Economic Growth in the United States and the Alternatives Before Us, New York: Committee for Economic Development, 1962.

investigations, however, have raised questions about the accuracy of this estimate and have suggested that the effect of schooling alone is somewhat higher. Most experts now feel--including the researcher originally offering the 60 percent estimate--that the percentage of income differential directly due to schooling is somewhere between 67 and 82 percent.[5] One study agrees with the range of schooling effects suggested earlier, but points out that earnings increased consistently with increases in class rank and college quality (the latter determined subjectively).[6] Thus, while it is true that schooling alone is a potent factor in accounting for income differentials in later life, it is at the same time true that non-school factors continue to play a very important role.

The importance of both formal schooling and non-school personal characteristics as income producers is further clarified in Figure 1, in which it can be seen that there is considerable variation around the mean incomes of those holding a college degree and those who never went to college. More important,

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[5]For two recent reviews of the research literature dealing with this topic, see Levin, et al., op.cit., and Witmer, D. R., "Economic Benefits of College Education," Review of Educational Research, 40, 4 (October, 1970).

[6]Weisbrod, B. A., and Karpoff, P., Monetary Returns to College Education, Student Ability and College Quality, Madison: University of Wisconsin, Department of Economics, 1967.

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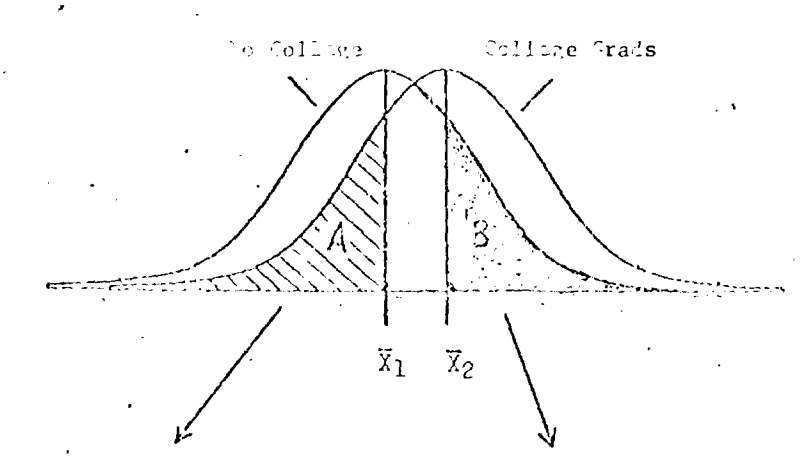
Figure 1

Overlapping Income Distributions for

High School Graduates and College Graduates During

Years of Peak Income



Even at period of peak earnings 25% of the college graduates made less than the mean of the high school graduates of similar age who did not to go college.

One out of every five high school graduates with no college had a higher income during his peak years than the average college graduate of the same age.

Note: These income distributions are presented only to illustrate the overlapping nature of the income of these two groups. The actual shape of the income curves for both groups is probably skewed, not normal as suggested here. The source of these data is the 1950 census, as reported in Glick, Paul C., and Miller, Herman P., "Educational Level and Potential Income," American Sociological Review, 21, 3, (June, 1956).

there is considerable overlap between these two distributions. Specifically, one-fourth of the college graduates made less than the average high school graduate of similar age who did not go to college, and one-fifth of the high school graduates who never went to college earned more than the average college graduate. Though it is only an estimate, it would appear from these data that probably one-third of the college graduates earned no more than they would have made had they not attended college at all. Such information is even more meaningful when considered in conjunction with the data regarding class rank and institutional quality referred to earlier. Those who rank toward the bottom of their college graduating class or have attended colleges of questionable quality will almost surely be overrepresented in the low end of the income distribution for college graduates represented in Figure 1. Data reported by Patricia Cross indicate that the increasing percentage of high school graduates attending college will come from the lowest aptitude quartile of high school graduates.[7] It is not unlikely that many of these students will never graduate from college in the first place. Of those who do, it is likely that a sizable proportion will rank

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[7]Cross, K. Patricia, "Planning for New Students to Higher Education," a paper prepared for the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives, 1971.

in the lower half of their classes, graduate from institutions of mediocre quality, or both.

Financial Benefits and Increasing College Enrollments

A second major factor limiting the generalizability of the notion that going to college results in greater earning power is the simple fact that as more and more high school graduates attend college, the value of the college degree (in terms of earning power again) will almost certainly decline. As Witmer has pointed out, "...one can expect the (constant dollar) monetary value of college education to fall gradually relative to costs as the percentage of the population graduating from college increases."[8] Assuming the present college enrollment trend continues, the college degree will become much like the high school diploma was fifteen or twenty years ago. It is at the same time true, of course, that in some ways the monetary value of the college degree will be more important than it is now. If, for example, 85 or 90 percent of our high school graduates go on to earn a college degree, the financial position of the college graduate will be relatively worse than today in that his "credentials" will be no better than those of the great majority of his peers. He must still compete for jobs with a great many people with similar educational attainments.

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[8] Witmer, op.cit., p. 515.

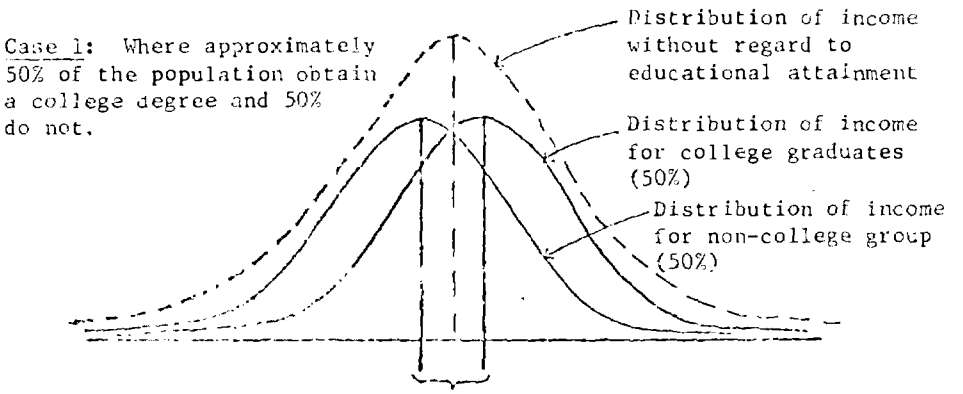
But he will clearly be much better off with respect to those who choose not to go on to college. Thus, the income differential between high school and college graduates can be expected to be even larger than it is now, since those without a college degree will have an increasingly difficult time finding jobs. This is illustrated in Figure 2, where two examples--one in which 50 percent of the population graduate from college and one in which 90 percent graduate from college--are used to make this point. Going to college will not give one an advantage over very many people of the same age (as it has in the past), but it will at least prevent one from being pushed out of the running. Young people, it seems, will have everything to lose if they don't go to college, but very little to gain if they do. One might say that going to college is increasingly becoming a defensive rather than an offensive career decision.

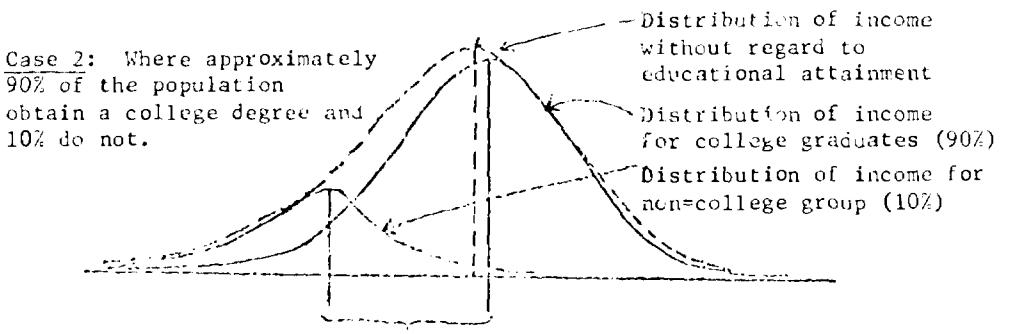
The Involuntary Campus

It has of course always been true that many students went to college not because of intrinsic interest in pursuing study in one field or another, but because they recognized that a college education would increase the prospects of a stable financial future. But generally, this attendance has been voluntary in the sense that it really wasn't necessary for the student to attend college in order to compete for a fairly wide array of satisfactory jobs, nor was any particular stigma attached to the student who decided against a

Figure 2

Comparison of Income Distributions for College and no-College Groups When Different Percentages of High School Graduates Attend College





Note: Case 2 (where 90% of the population obtain a college degree) has a bigger difference in mean incomes but finds more college graduates below the grand mean.

college education. As the percentage of high school graduates going on to college continues to rise, however, the voluntary nature of college attendance begins to vanish. As Martin Trow has pointed out, "The growth of enrollments and the movement toward universal higher education has made enrollment in college increasingly obligatory for many students, and their presence there increasingly 'involuntary.'"[9] Trow agrues that as the soaring enrollments make colleges resemble secondary schools, some of the same problems which have beset secondary schools for years begin to appear at the college level, especially problems of student motivation, boredom, and maintenance of order.

The overall effect of the involuntary student syndrome is that more and more college classrooms are being filled by students "who really do not want to be in college, have not entered into willing contract with it, and do not accept the values or legitimacy of the institution."[10] This line of argument seems to suggest that the presence of the involuntary students on campus may be a major factor in the rash of student disturbances and other expressions of discontent on American college campuses during recent years. While not denying the legitimacy of many student complaints about poor teaching, disinterested faculty members, and the like, the "involuntary student" argument suggests that much of the blame for

[9]Trow, Martin. "Reflections on the Transition from Mass to Universal Higher Education," Daedalus, 99, 1 (Winter, 1970), p. 25.

[10]Ibid., p. 26.

the campus disruptions and disillusionment comes from forcing youngsters into college who, at this time in their lives, have no interest in being there, and consequently find much that they dislike.[11] Kingman Brewster, president of Yale University, makes much the same point: "...a university, too many of whose members feel captive, is corrupted, distracted, and fouled for all its members. Higher learning cannot work if it is involuntary."[12]

Opposition to the involuntary student movement from a slightly different point of view--the negative consequences such trends have on the quality of American higher educational institutions--is made by Fritz Machlup of Princeton. Machlup points out that

> ...higher education should be open to all who want it and can take it. But we cannot change the fact that perhaps 80 percent of the people find it not relevant to their interests and capacities. This is especially true of those who have been denied an adequate preparation at home and at school. Broader, continuing education also should be open to all who want it, and many more will be qualified for it. What I deplore is that virtually all colleges and universities are reducing academic requirements and the level of their offerings in the name of social justice and equality

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[11] It should be pointed out here that most research on student protestors and activists indicates that these students are highly able academically. Thus, if the increase in involuntary students is a force behind the campus disturbances--to the author's knowledge there is no good evidence on this point--it is clear that the involuntary students in these cases are not "poor risk" students in the usual sense.

[12] Brewster, Kingman, "The Involuntary Campus and the Manipulated Society," Educational Record, Spring, 1970, p. 102.

> of opportunity, that is, in order to accommodate more of those who are not prepared to take higher education.[13]

It is worth noting that each of these opponents of the movement toward the "involuntary student" stresses the negative consequences of such a trend for the institution, in two cases in terms of the disruption that results when students become dissatisfied with its "irrelevant" programs of study, in the other case in terms of the watering down of institutional "quality" via a reduction in academic requirements. It would seem, however, that this concern for the welfare of the institution may be overdramatized and, compared to the needs of the individual students, not all that important. If the move toward mass education could be shown to have long-run benefits for the individuals involved, the dire consequences predicted for the institutions--if at all accurate--diminish in importance. The difficulty, however is in demonstrating the positive consequences for the students, and recognizing the very real possibility that the consequences for them may be negative as well. One might well ask, "What about the students?" How are they going to feel when, on top of resenting the pressures imposed on them to attend college, they discover that the rewards of their endurance--the financial gains they had been led to expect--may not be available after all?

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[13] Machlup, Fritz, "Longer Education: Thinner, Broader, or Higher," Proceedings of the 1970 Educational Testing Service Invitational Conference on Testing Problems, Educational Testing Service, Princeton, New Jersey (in press).

Getting the Job vs. Doing the Job

Obviously, one of the major difficulties in all this is the level of educational attainment required by many employers. The fact that a college degree will not provide a financial advantage when 80 or 90 percent of the high school graduates attend college does little to detract from the harsh reality of the fact that the 10 percent who do not go on to college won't be able to get a job! Educational requirements for most jobs have risen dramatically over the past 10 years, and it is difficult to say whether the rise in requirements has resulted in the increase in college enrollments or the increase in enrollments has given employers the opportunity to raise educational requirements. In either case, the plain facts are that college degrees are now required for many jobs which formerly required only a high school diploma. This situation has prompted one skeptic to ask: "Are academic credentials important for doing the job--or just for getting it?"[14] This question indicates awareness of the fact that much of the upgrading in employers' educational requirements has been arbitrary. It would now appear that too many employers are demanding too much education for the job they offer. A comparison of 1960 census data with the U. S. Employment Service's descriptions of 4,000 jobs clearly shows that highly educated people are employed in jobs that require

[14] Berg, Ivar, "Rich Man's Qualifications for Poor Man's Jobs," Transaction, 6, 5 (March, 1969), p. 45.

less education than these people actually have.[15] Beyond the unfortunate aspect of many people making certain sacrifices to obtain more schooling than they eventually need, this situation has (or can have) serious consequences for the employers as well. In certain cases educational attainment bears a negative relationship to job performance and worker morale. Numerous studies in industrial settings suggest that many better-educated employees are assigned to positions requiring low skills (or, at least, skills not related to educational experiences) with high turnover, low productivity, and worker dissatisfaction as frequent results.

The sometimes negative consequences of unrealistically high educational requirements are not limited to business and industry. American education itself may ironically be the best example. Many states and school districts have rigid regulations regarding educational requirements necessary for salary increases and promotions. Such policies, of course, are based on the premise that the greater the number of college credits accumulated, the greater the contribution one is able to make to the school system. Interestingly enough, several studies have indicated that as teachers' educational attainments rise, teacher mobility increases,

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[15] Ibid.

with the teachers often moving out of education altogether into positions in other fields. To quote Berg again:

> Thus, for school systems to tie pay increases to extra credits seems to be self-defeating. Teachers who earn extra credits apparently feel that their educational achievements reach a point beyond which they are overtrained for their jobs, and they then want to get administrative jobs or leave education for better paying jobs in industry. The school districts are, in a sense, encouraging teachers not to teach.[16]

Will Still More Education Become the Trend?

If, as suggested in this paper, the increasing percentage of high school graduates attending college will have the net effect of weakening the influence of a college degree as an income-producing asset, doesn't that simply mean that still more education will become the avenue to the same goal? There is already abundant evidence that just as the percentage of high school graduates going on to college is rising, so is the percentage of college graduates going on to graduate school.[17] The overlapping income distributions referred to earlier (see Figure 1) will no doubt change, but the major nature of the change may simply be that both curves are pushed upward. This possible trend is shown in

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[16] Ibid., p. 48.

[17] A Fact Book on Higher Education, op. cit. In 1955, 8.8 percent of all students attending accredited colleges were enrolled in graduate school. Today that figure has climbed to well over 11 percent.

Figure 3. As indicated, as the percentage of the population attaining higher educational levels increases, those with less formal education fall further behind in the income distributions. But, in the long run, the net effect may simply be that the educational attainment norms are stepped up--i.e., elongated--with the economic value (to the individual) of educational attainment remaining essentially the same. In 1960, those without a college education made less money than college graduates, but there were many people without a college degree and therefore some competitive balance. In the year 2000, assuming present trends continue, it may well be that those having a college degree will be much like the high school graduates of 1960. They will be much better off than those not going to college (there will be far fewer in the latter group), but will now compete with a sizable population of people with graduate training.

Summary and Policy Questions

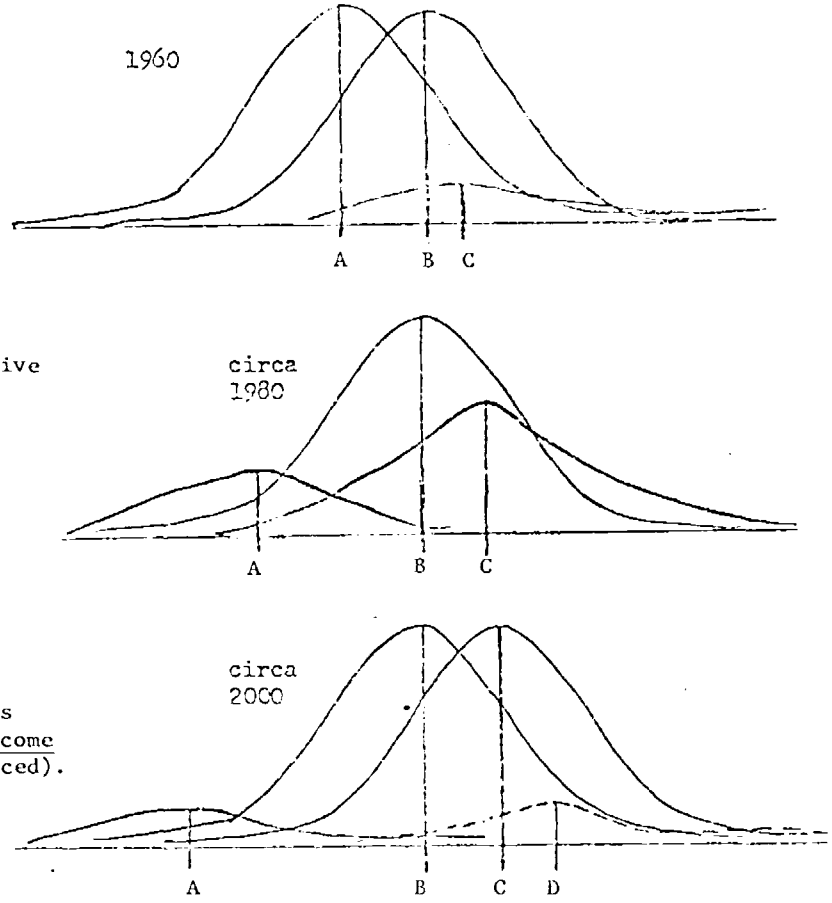
This paper has attempted to show: 1) that the percentage of high school graduates going on to college has been increasing steadily and will most likely continue to do so, 2) that a very high percentage of these students are attending college because of the perceived financial gains that will result when, in fact, for a great many of these students, such gains may not be achieved, and 3) that the net effect of tying job entry to educational attainment

Figure 3

Changes in Income Distribution Curves

With Increasing Levels of Educational Attainment

A = Mean income of non-college population
B = Mean income of college graduates
C = Mean income of those with graduate education
D = (In bottom drawing only) Mean income of those with still more education



Note: As with Figure 1, these curves are not drawn to precise data and are intended to be illustrative of basic trends only. Note that the relative income differential between high school and college graduates increases with the increase in the percentage of the college-going population, and the differential between the college graduates and those with graduate training also increases as the percentage of college graduates going on to graduate school rises. An important part of this explanation is that employers' demands or job requirements keep pace with the supply (Miller, Income Distribution in the U. S., as referenced).

in many occupations may simply be to prolong the number of years of compulsory education, with little benefit (financially) to the very students who view this as the primary purpose of higher education.

Numerous research and policy considerations follow from these assertions. First, it would seem imperative to learn much more about the relationship between educational attainment and job performance in many occupatio. . For how many and what kinds of occupations do educational attainment requirements seem unnecessarily high? Does the utilization of high educational requirements, without evidence for their relevance for job success, serve as another form of discrimination against groups from disadvantaged (economically and educationally) backgrounds?

More needs to be known about the relationship between various college experience data (e.g., college "quality," rank in class, major field) and subsequent job opportunities, success, and satisfaction. Would those students who attend low-quality institutions or rank toward the bottom of their classes in the better ones have done just as well had they not even attended college, especially considering such factors as college costs (rising sharply) deferred income, and the like? Also, in view of the fact that a great many students regard college as a major

avenue to improved financial status (see Table 1), it would seem to be of paramount importance to examine the factors that influence student expectations of the benefits of college, the extent to which these expectations change during the college years, and whether the students feel that their perceived needs (especially financial) have been satisfied.

What kinds of post-secondary training or schooling would seem to be most appropriate for what kinds of students? The "relevance" of higher education can only be considered in the context of the purposes one sees education as serving. Nevertheless, the typical liberal-arts program would seem appropriate for only a small portion of the students now in higher education. Institutions offering a greater variety of education and training programs are badly needed. As the recent Commission on Tests of the College Entrance Examination Board pointed out:

> American colleges have often been characterized as diverse; it seems clear that they must become more so, both at the institutional level and within their curriculums, if they are to serve nearly all American young people in an increasingly complex society. People are also diverse, more so than colleges have yet learned to take into account in their procedures, their programs, or their instruction.[18]

American higher education has been criticized in recent years for being an elite institution serving mainly as a credentialling agency

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[18] Righting the Balance, Vol. I of the College Entrance Examination Board's Report of the Commission on Tests, CEEB, New York, 1970, p. 39.

for upper-middle class youth. These criticisms are just, and have been long overdue. In reshaping American higher education, however, great care must be taken to insure that egalatarian ideals are not being used to create an illusion. Opening wider the doors of admission to college will be a bitter travesty if new doors to satisfactory job opportunities are being erected and kept closed. Much more attention has to be given to the relationship between formal education and occupational opportunities, and to the whole notion of tying income benefits to quantity of formal schooling. Some means must be found for enabling a far greater percentage of American people to attain the comfortable standard of living so many of us take for granted. But is more education the answer?

LEARNING TO LEARN IN INFANCY: THE DEVELOPMENT OF COMPETENCE MOTIVATION*

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In the last decade much effort has been devoted to the study of the intellectual growth of infants and very young children. Most emphasis has been placed on what kinds of environments and what kinds of experiences are most efficacious for maximum intellectual development. Alternatively, a large amount of effort has been devoted to the study of the personality and social growth within the opening years of life, for example, Goldberg and Lewis (1969) and Messer and Lewis (1970). Attempts have been made to answer such questions as what constitutes a normal and healthy personality and facilitates proper social development.

It is clear from research with older children and adults that one cannot separate these two aspects of human behavior. Indeed, maximum intellectual development can only occur within a framework of a sound personality. Knowing this about older children should alert us to its importance for understanding and affecting infant and very young children's intellectual growth. Review of the infancy research

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* Prepared for the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives.

literature on the interrelationship between personality and intellectual growth reveal relatively little interest and information on this most important problem (Lewis, 1967). It is as if researchers in infant learning were somehow unaware of the results obtained for older children. This lack of information is surprising but, more important, it is essential to our understanding of how to effect positive change or accelerate growth in the intellectual ability of infants. To understand the importance of uncovering the personality and social factors most conducive for optimum development of mental faculties, it must be remembered that the intellectual growth and development of human beings start from birth (most probably even before--in the last trimester of pregnancy). No longer will the evidence allow us to think of the infant as an insensate, unorganized mass of confusion. The evidence is clear; in varying degrees from birth onward we have a sophisticated organism capable and willing (we shall return to this important point later) to learn and one which is influenced by his experiences in his world.

The absence of sufficient information about the relationship of personality and intellectual growth is still more disturbing in light of the recent social demands for far-reaching changes in the child rearing structure of society. What effect infant day care centers and programs will have on the intellectual and personality development of infants is still to be determined as are the optimal

conditions for day care. Moreover, alternative models, such as parent-child centers with their emphasis on producing better parents rather than babysitting for infants, must be considered.

Of interest to this subject is the slowly growing body of information on one aspect of personality, namely the issue of motivation to learn. The remainder of this essay is directed toward this issue. It is proposed that without sufficient motivation the best intellectual climate, the finest curriculum and materials will be of no avail. The motive to learn would seem to be natural in all humans. Look how easily and effortlessly children learn. Indeed they do and it has been proposed that the failure of motivation must be due to some aspect of the child's environment which does not give this motive a chance to reach fruition. In the following argument we shall attempt to demonstrate that this motive is intimately tied up with the child's belief in his ability to affect his world and that this belief is acquired very early. A more full discussion can be found in Lewis and Goldberg (1969) where a more detailed review of the experimental literature can be found.

For parents and educators, one of the most interesting developments to emerge from the recent psychology investigations is the strong indication that the intellectual growth of an infant is closely linked to the responsiveness of the people around him. That is, a baby, whose mother or father, or caretaker pays attention to him,

answers him when he cries, smiles at him when he smiles, talks to him, and plays with him, learns more and learns it faster and is generally brighter than a child who is ignored.

In a series of studies we have recently given much attention to the nature of the maternal response to the infant's behavior as the basis for his intellectual growth and have suggested that at least two dimensions of the mother's response are important in affecting the infant's development. One is the total amount of stimulation provided the infant by the mother, while the other is the relationship between the infant's behavior and the mother's response (Lewis and Goldberg, 1969).

While recognizing the importance of the quantity of stimulation provided the infant, it is the relationship between the infant's response and its outcome that is of primary concern. In this interaction an important motivational principle is established, namely, the infant's belief or expectation that his behavior has consequence in affecting his environment.

Let me present an example. The infant experiences some uncomfortable somatic sensation (call it hunger) to which he responds by crying. Assume that the mother, hearing the cry, goes to the infant, picks him up, and feeds him. If her behavior is consistent, it reinforces the event-action relation (namely, discomfort-cry) and develops within

the infant an expectation. The plan or expectation built by the infant is produced in this manner: uncomfortable sensation → action → cessation of sensation. In other words, his cry or behavior was effective in relieving his pain. How much different is this from the experience of the infant who cries under the press of an uncomfortable somatic sensation and is not picked up and fed consistently or who cries and is not attended to because his mother, busy with other children, cannot reach him until several minutes after the onset of crying when he can no longer remember the event-action relationship. Or the institutionalized infant who, because of the institution's schedule, cannot be held when he wants to be and is held when he does not want to be. In other words, although he may receive equal amounts of stimulation, these are unrelated to his action and thus the principle of affecting his environment by his action is not learned well or is delayed.

In general form, what we have been hypothesizing is that quantity and timing of maternal response to the infant's behavior, and the degree of consistency of her responses have important motivational qualities, namely, the nature of the maternal response develops and reinforces the infant's belief that his behavior can affect the environment.

The study of institutionalized infants provides information to support this motivational view. It has been shown that

institutionalized infants differed from home-reared infants not in whether they exhibited a skill or when they reached a developmental stage, but whether they utilized the skill. For example, data indicate that the institutionalized infant stands up in his crib at about the same age as the home-reared infant. That is, the maturational sequence was unfolding at the same rate for each of the groups, but the institutionalized infants showed no desire to practice the skill. Thus, it was the motive rather than the skill or structure that differentiated these groups. It was not how much of the skill or structure that was important in differentiating the infants, rather it was the motivation to use the skill. We suggest that the basic quality of that lack of action was the infants' belief that their behavior could not affect their environment. With such a belief, it was little wonder that they gave up. This issue of giving up can be seen in disadvantaged groups at later ages. That is, if they cannot affect their environment, then what is the sense in trying? Lower class children, in a number of studies, have demonstrated that they lack the belief that their actions can affect their environment. A review of this literature is to be found in the paper by Lewis and Goldberg (1969).

Moreover, data on affectance indicate that it is an important variable for predicting achievement behavior and learning such that the firmer the belief that one's actions are effective in controlling reinforcement, the greater the achievement behavior and the better the learning. It is the growing belief that individual differences in the motive of

powerfulness are acquired in infancy as a direct function of the relationship between the infant and his caretaker, most often his mother.

With this in mind, it becomes clearer that the role of the mother in the child's intellectual growth is not restricted to emotional security but also rests in her ability to provide a strong motivational basis for learning.

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TEACHING IN THE KNOWLEDGE SOCIETY*

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Everyone agrees that our educational system needs good teachers, but few agree on what is meant by the "good" teacher. There is also considerable dissatisfaction with and criticism of teaching, teachers, and teacher education (Holt, 1964; Silberman, 1970). The criticisms are multitudinous and varied. The most common charges are that the schools destroy children's desire to learn; fail to produce adequate achievement; do not supply sufficient and well-trained scientists, engineers, business managers, doctors; produce an uninformed citizenry susceptible to the attractions of alien philosophies; and fail to educate children fully to the hazards of drugs, tobacco, and alcohol. Few social ills of our society have not been attributed to a failure of the schools to do something that would have prevented the genesis and development of these ills.

On the other hand, Americans vigorously defend their school system. Despite the disruptions in the universities in recent years, Americans pride themselves in having created the first system of universal

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* Prepared for the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives.

higher education. Despite recurrent taxpayers revolts, the United States has spent more on education in the late 1960's than on defense "We spent more on education than on all other nondefense community services together--health care, welfare, farm subsidies, and so on." (Drucker, 1969, p. 311). This ambivalence about education, on the one hand strongly critizing our educational system, and on the other hand, munificently supporting it and urging its expansion, is symptomatic of the great value American society has come to place on the education of its citizens.

The most interesting characteristic of this criticism is that it almost invariably focuses on the quality of teaching and teachers and has stimulated a decade of efforts to reform teacher education. Since the 1960's considerable attention and money has been spent on surveys and analyses of teacher education, the best known of which was James Conant's study, reported in his book, The Education of American Teachers (Conant, 1963). The federal government, through the U. S. Office of Education, has poured large sums of money into the analysis of teaching and teacher education--there are two research and development centers devoted to teaching and teacher education; a program for the radical renovation of the training of elementary teachers has progressed through its first two phases; conferences on teaching have been numerous; a sizeable portion of the basic research supported by the Office is focused on teaching behavior. But, little change has occurred. It is

pointless to criticize the critics of American education and its teachers for not having developed a solution to the problem of improving the quality of teaching. It is not easy to point to alternative solutions which will guarantee a renovation in teaching.

But, as one reads the analyses of American education that have appeared in such abundance in the past decade, one cannot help but be struck by the lack of analysis of the fundamental changes which are occurring in American society which have had and will continue to have a profound effect on the character of teaching in our society. All of these analysts, critics, and reformers are socially sensitive and perceptive. All are aware of the profound changes occurring in American society. All have noted the many changes that universal education is producing in American society, yet, with few exceptions, most have failed to relate the directions in which American society is obviously moving to the kinds of changes that will be needed in teaching in the '70's and '80's.

A profound change has occurred in American society, a change more fundamental than the change from an agricultural to an industrial society. This change can be attributed to the provision of more education to large numbers of people. In the decades following World War II, America has moved from a manufacturing-economy to a knowledge-economy. The consequence has been a change in the nature of work in American society whose implications for education, and

specifically for teaching, have been only dimly forseen and are yet not fully understood. There is every reason to believe that focusing attention on this change in the nature of the American economy and society is essential if we are to understand what changes need to occur in American education.

If the critics, the reformers, and the analysts of American education in the past two decades can be faulted, it is for having offered classical and historical remedies to an emerging society profoundly different from any that has existed in history. Thus, those reformers who have urged that all teachers be liberally educated solved one part of a problem. But those reformers who urged this particular change have failed to see that the general education provided for the American college student is itself an anachronism. Those, like Silberman most recently, who urge open and creative systems in teaching, fail to give sufficient significance to the world into which the child will eventually emerge.

This paper beings with an analysis of the nature of American society as being rooted in a knowledge-economy, the vast majority of whose citizens are knowledge-workers. It raises the question, what kinds of teaching is needed in such a society? It proposes programs of research and development to develop the kinds of teachers that such a society will need in the next several decades.

The Change of the American Economy to a Knowledge-Economy

> In the last twenty years the base of our economy shifted from manual to knowledge work, and the center of gravity of our social expenditure from goods to knowledge. (Drucker, p. 287)[1]

A knowledge-society and a knowledge-economy are not synonymous. A knowledge-economy is, as its label implies, an economy in which knowledge is the chief product; in which knowledge is exchanged for profit. A knowledge-society is one in which the social mores, customs, social relations, and systems for organizing work and leisure derive from the fact that large numbers of the members of the society are engaged in the work of the knowledge-economy.

The knowledge-society has not fully emerged in American culture, but is rapidly developing. Those aspects of it which have emerged are not readily understood or perceived by many Americans; for example, the knowledge-worker is the single most important source of capital investment in the United States, but, many Americans probably still believe that capital produced by commerce is the major source of money in this country.

What is a knowledge-worker? A knowledge-worker is a person who systematically applies knowledge to work. "Knowledge, like electricity

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1 The ideas in this section are derived largely from Peter Drucker's, The Age of Discontinuity: Guidelines Toward Our Changing Society.

or money, is a form of energy that exists only when doing work." (Drucker, p. 269)

The connotations of the term, "knowledge," when used in the phrase, "knowledge-economy," or of the label, "knowledge-worker," are limited. They may be understood by contrasting them to the way in which intellectuals generally use the word, "knowledge." To the intellectual "knowledge" means the discovering and acquiring of ideas, facts, and theories. Knowledge used in the sense of knowledge-worker or knowledge-economy is a more limited sense of the word. Knowledge in this context means the application of ideas, theories, principles, and facts to problems whose solution yields more effective work or generates new work.

The best and most widely known example is the use of knowledge to produce the achievements of the space program and all of its spinoffs. For example, the scientists in the space program were faced with the problem of developing heat resistent materials with which to cover rockets. The successful solution to this problem has not only facilitated the "work" of the space program but also generated new forms of work by using these materials in a wide variety of applications such as in cooking utensils.

Computer scientists and computer programmers are good examples of knowledge-workers. The former develop new forms of computers to

solve specific problems; the latter apply programming concepts to solve problems.[2] (Some computer scientists, like the mathematician or theoretical physicist, may not be interested in the application of computer science concepts. But, since the relationship between basic research and theory and its applications is so well developed in this country, the basic scientist is usually regarded as a knowledge-worker).

"The knowledge-industries" in 1965 accounted for one-third of the national product; by the late 1970's, they will account for one-half of the national product. "Every other dollar earned and spent in the American economy will be earned by producing and distributing ideas and information, they will be spent on procuring ideas and information." (Drucker, p. 265) Also, the number of knowledge-workers will increase tremendously in the next fifteen years. The teaching profession now constitutes the single largest sector of the occupational work force. The knowledge-industry in the United States will need a million computer programmers, a half-million system engineers, system designers, and information specialists, and two million health-care professionals.

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2 The two examples used here should not lead the reader to believe that the application of knowledge is confined to the natural and biological sciences. The social scientists are playing an increasingly important role in the economy. As Drucker has pointed out every aspect of every field of knowledge has developed some forms of application which are significant for the world of work. Drucker notes that even biblical scholar's knowledge is prized by the Israeli and Arabs. (Drucker, p. 266)

The Social Consequences of a Shift to a Knowledge-Economy

There are many changes that have occurred as a consequence of our society becoming a knowledge-society and our economy becoming a knowledge-economy. Several of these are significant to note in this paper because they have implications for the organization of teaching and the training of teachers.

One of the more obvious and significant changes is the change in the level of education required for many jobs. As Drucker has pointed out, the character of the work has not changed correspondingly, but, the effect of requiring more years of schooling and expecting more years of education for a job has had profound effects on the expectations of a potential worker. He expects to use his acquired knowledge. In this respect, he differs markedly from the craft worker who has acquired a skill which he uses repeatedly, and who expects to benefit gradually from experience acquired over a period of many years. The knowledge-worker, in contrast, comes to his work with a fund of knowledge that he expects to apply immediately. Unlike the craft worker, he expects to influence the nature of the work in which he is engaged and to produce significant changes in it. The craft worker, expects to do his job essentially the same way over many years. If his job is modified it is usually by the application of knowledge by the knowledge-worker.

Another change that has occurred is that the knowledge-worker

frequently is prepared for a second career at mid-point in his life. This consequence results in part from the expanded work-life of workers in American society. It also results from the kinds of needs knowledge-workers have for continuous growth and stimulation. Even a knowledge-worker's job can become routine for the knowledge-worker when he has been at it for twenty or more years. Consequently, many knowledge-workers need second careers in knowledge work when they reach their forties.

It is becoming apparent to many people that the pace at which knowledge is acquired in early years is much too slow, and that there is a need to acquire knowledge (or skill) at a greatly accelerated rate during the years of work. Dislocations in industries, or changes in national priorities, and inventions and discoveries create a constantly changing world of work. Skilled and semi-skilled workers need to be retrained as the kind of work they do is replaced by new work. Knowledge-workers themselves need to upgrade their knowledge; for example, psychologists trained in the '30's had to acquire the statistical techniques that first-year graduate students now learn in one semester. Many scientists in many fields are learning to use computers, not only for routine calculations but also for simulations of the processes they are trying to understand.

Perhaps the most profound change to have occurred in American

society, although it is not as apparent as some of the other changes, is the value now being placed on knowing. A long history of anti-intellectualism in American society hides the fact that in recent years large numbers of Americans have been educated in college, that the knowledge acquired by these individuals is used so extensively throughout our economy that we can call it a knowledge-economy, and that despite recurrent attacks on university systems no one would consider their destruction or a reeducation in their growth.

We have the most highly educated society in human history, one whose social forms are rapidly changing to accommodate the desires and needs of large numbers of literate and independent-minded individuals. This society is becoming more democratized. Authority is being diffused. Although there are status differentials in our society, we are creating a society that is classless[3] because the differences created by birth and heritage have been effectively eliminated by having all individuals achieve status through education.[4]

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3 There will always be status differentials based upon achievement of goals valued by a society. In our society these achievements will usually be rewarded economically, but it is no longer possible to create classes out of these status differentials.

4 Our society could become a two-class society in which the classes are divided on the basis of education. There is, at present, some distinction made along these lines because amount of education is correlated with economic rewards. It is likely, however, that such distinctions will be removed within the next twenty-five years. Integration of the schools was an important step in this direction. Further, making higher education available to more students is another step in this direction.

The basic commodity on which status is achieved is available to all. Thus, a new kind of society is emerging in which most of the members of the society work with their minds rather than their hands and in which this work equalizes the social status of the members. Responsibility and authority in such a society is more widely diffused, and is based on demonstrated achievement rather than class position. This society is so unique that we do not know how to organize it.

This new society faces two problems. First, we need to know how to organize the social and professional life of large numbers of knowledge-workers. These knowledge-workers are most effective in organizations; but, they have been educated for independence and initiative. Many of them presently feel constrained by the demands of an organization for cooperation, integration, and interdependence among knowledge-workers. Also, such knowledge-workers need a variety of incentives in addition to economic ones. The knowledge-worker must have a challenge, opportunity for continued growth, and an opportunity to use his knowledge in what he regards as desirable ways. In all of these respects, he differs from the craft and skilled worker.

Our society is organized to maintain the craft worker, the individual professional, and the white-collar worker. One of our first problems will be to develop new life styles in organizations and

new organizational arrangements which will facilitate the work of the knowledge-w rker.

Our second problem is to devise an educational system which stimulates the creation and development of more knowledge-workers. In a knowledge-economy, the success of the economy depends upon its ability to generate knowledge-work. If, for example, knowledge in the field of computer programming were to remain constant, the activities of the computer programmers would expand, but the growth rate in this knowledge-industry would evenually stabilize. However, because we educate computer programmers so that they generate new knowledge-work, the growth rate in this knowledge-industry will be exponential. A knowledge-economy has, in principle, unlimited growth potential because a knowledge-industry generates new knowledge or new applications of knowledge which in turn create knowledge-work.

It is important to contrast what a knowledge-economy will probably be like with a system based on manufacturing. Our social system is and has been one in which a relatively small number, and in some instances an absolutely small number, of individuals have developed new ideas or have invented technological devices that have had applications which created fields of work. The invention of a working light source called the light bulb, for example, stimulated the creation of an electrical industry. This industry has grown

by distributing electrical energy in the form of light and heat to a wide variety of sources. The upper limit of the growth of this industry is a function of population growth and of finding new ways of using electricity. When everyone has adequate lighting and heating, the growth of the electrical industry will become stable. If population expansion is also controlled, it will cease to expand. Only if new applications of electrical energy are found, a task for the knowledge-worker, will this industry continue to expand.

The use of computers is an example of another kind of knowledge-industry. As the computer is used in new applications, new knowledge is generated about the process of applying computer concepts to problems, and new knowledge is generated about the computer itself as a mechanism. This new knowledge about the computer stimulates new applications of it in the solving of problems. These applications in turn generate ideas for other applications and for other uses of the computer. This knowledge-industry has unlimited potential for growth because it constantly recreates itself in new forms which in turn create new kinds of knowledge-work.

Contrast these two industries with the steel industry. This industry provides goods for uses which have remained unchanged for decades. The industry does use knowledge-workers to improve its products and methods and to seek new applications. But, the

industry does not produce knowledge-work nor does it need large amounts of knowledge-work performed within it.

It is the former types of industries and businesses which will dominate the economy in the '70's and '80's. These organizations will need very large numbers of knowledge-workers.

The obvious conclusion is that a society built on a knowledge-economy must have an educational system which provides knowledge-workers. Does the American educational system provide knowledge-workers at present? Yes, but in relatively small numbers. Large numbers of students are either untrained for knowledge-work or are not trained to apply knowledge to generate either new knowledge or new knowledge-work.

An example of the type of educated person who is not likely to become a knowledge-worker or who will become a pedestrian and routine knowledge-worker may be found in the large number of graduates from liberal arts colleges who have majored in fields such as history or English. These graduates find their way into teaching, journalism, and television. In the broadest sense, they are knowledge-workers in these fields, but in a stricter sense, they are not knowledge-workers. Their work requires them to use knowledge; they communicate knowledge; they acquire new knowledge; but, they do not systematically apply an organized

body of knowledge to the solution of problems either because they do not know how to apply knowledge in solving problems or because they do not have the knowledge necessary to apply it to solving problems. Their education is irrelevant to their work.

The history major who becomes a teacher, for example, may do so by taking some courses in psychology and teaching methods, and by having some supervised teaching experience. Usually he becomes a journeyman teacher. He is not capable of inventing new teaching strategies or of coping with diverse teaching problems. He is most likely to lecture his students at greater or less length, devise fairly pedestrian ways of evaluating their performance, organize sporadic discussions, and occasionally engage in dialogues with his students.

Similarly, an English major who goes into journalism or television knows very little about media. He has no systematic knowledge of the science of communication. He will learn the "trade" aspects of journalism and television on-the-job, but he too will be a routine worker who contributes nothing to the development of these media.

In both of these examples the student has been educated in a discipline in which he does not become a knowledge-worker. He subsequently takes a job in which he cannot use the knowledge-work

skills he has acquired. He works in a knowledge-work field or industry, but he is not a knowledge-worker because he does not systematically apply knowledge to the solution of problems in his field. Many individuals working in knowledge-work are more like the craft worker of old than they are like the knowledge-worker in the knowledge-industries.

Our society has large numbers of educated people who are likely to become the modern equivalent of the craft worker of old. These are people who have been educated in a field of knowledge which they do not use in their work. In many cases they are educated beyond their jobs. As we expand our system of higher education, we are producing more and more individuals of this kind. But we are not producing the kinds of knowledge-workers that a knowledge-economy needs for its continual development. We could within the next twenty-five years develop a highly educated population but see our knowledge-economy stabilize. We will have lost the potential for exponential growth that is inherent in a knowledge-economy because we failed to supply this economy with the kinds of workers it needs to continue to grow.

Inquiry and Knowledge-Work

It should be obvious to the reader that the concept of knowledge-work used here implies a kind of activity that is like scientific research, or, more broadly, disciplined inquiry and problem solving.

A knowledge worker is a problem solver. But he is distinguished from the generally educated person who can solve problems or the person who in his practical experience has acquired problem solving skills because he applies a coherent and organized body of knowledge to problems. The work of a statistician or an economist provides relevant examples. (I exclude here those statisticians and economists who are primarily or exclusively interested in statistical or economic theory). The statistician has a rich foundation in mathematics, statistics, and the applications of both. Similarly, the economist has a rich foundation in economic theory and its applications. Each man works on problems for which he thinks his body of knowledge may provide ideas and information relevant to the solution of these problems.

The statistician may be given the problem of producing a system for controlling traffic in New York City during the rush hours. He may apply what he knows about queing problems to this problem. The economist may be asked to advise Columbia University on its investment policies to produce more income from its endowment. He may apply what he knows about the investment policies of large insurance companies to this problem.

The knowledge-worker must have a foundation of information, concepts, theories, and knowledge of other applications on which to draw. But, he must have problem solving skills. His education must insure

that he has both.

Teaching and Instruction in the Knowledge-Economy

It is useful to distinguish between teaching and instruction. Instruction is an activity from which a person learns and the activity is organized with the intent of facilitating learning. Reading a book, watching a television program, observing the flight of birds, working a mathematics problem, writing an essay are a few examples of many different activities which if organized with the intent to produce learning may properly be called instruction. Teaching is also instruction but it is that subcategory of instruction which employs a human person to organize and mediate the instruction.[5]

A teacher frequently does what can also be done by a book or a teaching program. He also supervises learning that is being mediated by books or machines or television. These are instructional activities, they are not teaching (see footnote 5).

Teaching is those instructional activities which only a human

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5 This distinction is a common one but not a universally accepted one. Unfortunately, the denotations and connotations of these terms are practically identical. But, we need to make a distinction between what only a human person can do who instructs and what a book or a computer can do which also instructs. Here I arbitrarily call what the human person can do uniquely when he instructs, teaching; what both man and machine can do when they instruct, I call instruction.

person can perform. Although we do not understand well what is likely to be unique to the human instructor, we do have some ideas of the instructional activities that only a human can perform.

Heuristic Teaching

Heuristic teaching is a concept used to describe what the teacher does uniquely in instruction. In general, the teacher can stimulate and mediate processes whose components are interdeperdent, do not follow a necessary sequence, are not time dependent, and whose internal logic is obscure--in short, he mediates those processes which result in thinking and refined feeling. They are processes in which a person learns to learn as he learns. Our ways of conceptualizing these processes are far from being well formulated. Only one model has been proposed to date to describe them. (McDonald, 1971)

An example may help. A student wishes to undertake research on the effects of using drugs on interpersonal relations. He may have only a very general idea initially, one so vague as, "I wonder what drugs do to you." Beginning with this vague idea, he must shape a more specific one, such as the question about the nature of interpersonal relations in the drug culture, and eventually formulate questions whose answers he can find or hypotheses whose validity he can test.

A student may think through these questions for himself, but usually he will be working with an advisor, his teacher. The interaction between student and teacher will take many forms. The teacher will ask questions, he will give advice, he will suggest books and articles to read, he may suggest that the student talk to drug users to get the "feel" of the problem; even his silences or the ideas on which he does not choose to comment have significance. His goal is to stimulate the student's thinking so that the student does the work of sharpening his ideas for himself.

The more important aspect of this interaction is what the student is learning about this kind of thinking. He learns the processes and skills of critical thinking which will help in working on other problems and questions. He is becoming a skillful inquirer. He is learning to learn.

Heuristic teaching refers to styles of teaching which emphasize the development of self-initiated and self-directed pupil learning; which stress the pupil's discovering rather than absorbing knowledge; which place the student in the role of the inquirer; which aim at heightening the relevance of school to the pupil's life; which are concerned with the emotional and social development of the pupil as well as with his cognitive growth. Teaching in the heuristic mode represents no one style of teaching behavior or activity. It may be characterized as imbued with the spirit and

mood of inquiry, critical skepticism, invention, imagination, and enthusiasm for learning. It treats students as persons who can produce knowledge and understanding. It is revealed in sets of beliefs about the way in which knowledge and understanding are integral to personal development and the meaning of existence. It may be the essence of the varied styles of great teachers to inspire students to seek understanding.

We will not attempt here to describe in detail all that is meant by heuristic teaching. One way to understand more clearly what is implied in this concept is to look at heuristic teaching from the perspective of the teacher and then from the perspective of the student.

The teacher himself is an active inquirer, making the learning process itself a subject of his inquiry. Teaching is the means by which the teacher himself learns; he is as actively engaged in learning as his students.

He stresses openness of inquiry. He does not make arbitrary distinctions between knowledge and living, between understanding and being, between social importance and personal relevance. He helps students seek knowledge and understanding; he does not think of teaching as giving knowledge and understanding.

The character of his relations with students is different. He appeals to the authority of free inquiry rather than to the authority of persons. He does not impose his greater knowledge or deeper insight on students, but relies on their perceptions of his competence to stimulate them to seek him out as a guide.

The characteristic behaviors of students taught with heuristic teaching styles also takes many forms. The student is an active inquirer rather than a passive recipient of knowledge. He sees the process of learning as a way of achieving his most significant personal goals. His definition of his goals, of what in life will have significance for him, emerges out of the processes of learning. He also does not make an arbitrary distinction between being and learning, between personal relevance and education, between meaning and personal significance.

He assumes responsibility for his learning. He does not need to be goaded to learn, since the significance of learning has become intimately personal for him. He views education as a means of achieving his goals. He sees teachers not as threats to his personal integrity but as helpers in achieving and enhancing it. (McDonald, 1970)

Heuristic Teaching and the Knowledge-Economy

The knowledge-economy needs persons who are informed and who have

inquiry skills. It needs a school system which educates such persons in large numbers. It needs, therefore, a school system in which heuristic teaching is a significant, if not the predominant, teaching style; in which problem-solving is the principal activity; and in which the acquisition of inquiry skills is the expected outcome.

American educators have struggled for fifty years with variable enthusiasm and energy to orient instruction around problem solving. There are many reasons why their efforts have not been successful. But, it is now apparent that unless the school is reorganized around problem solving, it will not produce the intellectuals and knowledge-workers that will be needed in our emerging society. It will become increasingly wasteful of the money invested in it. If students do not bring back to our society the skills needed to foster its growth, their education will be wasted.[6] It will destroy

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6 Some of today's students and professors argue that our educational system is too closely tied to our economic system and to its social mechanisms. This view has a factual basis but it is limited and somewhat naive. Job training or vocational training may or may not produce a knowledge-worker; it may or may not emphasize learning inquiry skills. To the degree that it does not produce knowledge-workers nor emphasize the learning of inquiry skills, this criticism of the linking of the educational system to the economic system is just. But, it is naive to think that education can be divorced entirely from the society in which it exists or that acquiring an education will not have social and economic consequences. A knowledge-society, the one into which we are emerging, can be sustained only if the society reaps a "return" from what students have learned. Although we do not know all of the social and moral consequences of creating such a society, it appears to have more potential for greater human development than any that have preceeded it.

itself as it forces students to engage in meaningless tasks and to learn information whose purpose is not clear and which rapidly becomes obsolete and irrelevant.

There are many problems to be solved to reorient the schools to teaching the most human of all skills. The problem is how to introduce into the schools the kind of teaching that will make for the most intellectually, socially, and economically productive students. Even though we have only general concepts on what this teaching should be like, effective research and development can solve the many problems of describing this teaching and its effects, of how to train teachers to use this teaching style, of how to organize a curriculum that requires it, and of how to help students to adapt to it.

That research is badly needed is attested by one fact. There are only three references in the educational research literature of the past seventy-five years that describe problem solving teaching performances. (McDonald and Quirk, 1971) There is much philosophical and hortative literature but practically no descriptive or empirical studies.

Needed Research and Development Programs

The method usually proposed for renovating the schools' programs is to change the curriculum by introducing new content or giving

teachers special training. Such efforts have not always been notably successful, but, even if the defects of previous efforts are eliminated, these ways of changing the school are relatively slow.

Earlier in this paper we pointed out that many knowledge-workers are looking for and need a second career. Some are going into teaching, but when they do, they may not utilize their inquiry skills and ability to apply knowledge to problems; too frequently, they become just more information distributors who after a few months are indistinguishable from teachers who have been teaching for decades. Since there are substantial numbers of these knowledge-workers available, the shift from the didactic teaching styles of the schools to the heuristic teaching styles required for our emerging knowledge-society may be accomplished more quickly by infusing significant numbers of these knowledge-workers into the educational system. They could be rapidly trained for a second career in teaching or some of them could be trained to work part-time in the schools.

This training should have as its goal to utilize the special talents of these knowledge-workers; it should not be aimed at fitting them into the system. It should also be relatively brief, six months on a typical college schedule or three months of intensive training.

One of the goals of the training should be to help these knowledge-workers develop teaching procedures and curriculum content for learning experiences that will teach the application of knowledge and foster the learning of inquiry skills. We can assume that these workers have ample and rich experience in finding and solving problems. Their goal should be to teach others the skills of finding and solving problems, the skills of using knowledge to generate more knowledge, and the skills of applying knowledge.

Their educational program should be primarily the work of designing methods and content for new kinds of courses or learning experiences that emphasize inquiry learning and problem solving and that utilize heuristic teaching styles. They ought also to plan and conduct research on the proposals, and to plan and conduct the evaluation of what they propose to do.

They ought not to be trained to be a chemistry teacher or an English teacher. A scientist, for example, might take ecological problems as a starting point and develop a program to study the scientific, technological, and economic aspects of these problems. A television producer might design a course to develop new kinds of television programs, or new ways of using television. The work would be a genuine educational experience because it would demand problem solving skill and intellectual and technical knowledge.

The infusion of persons of this calibre doing the kinds of work suggested here would revitalize the schools. The curriculum would be "relevant" in the best sense of the word. The problem of relating the work of the school to the problems of today would be solved in a way that today's professors and teachers could not solve by bringing the world's problems into the school in the person of an individual who knows the problems and methods for attacking them. Such experiences would engage students in learning that had meaning for them. These new teachers would bring vitality, experience, and a fresh look at educational problems.

A second kind of program should involve these knowledge-workers in the training of teachers. The same kinds of activities proposed above can be adapted to teacher training. The goal, in this case, is that knowledge-workers be used to educate prospective teachers to use inquiry skills in developing their teaching strategies, and to teach them how to design inquiry-oriented lessons and programs. The knowledge-workers would design courses to train teachers for heuristic teaching; they would also design evaluations of these training programs.

The above two proposals apply a well substantiated psychological principle of learning. A model of what is to be learned is a most effective teaching tool. Students, teachers, and administrators would see what they now rarely see, a problem solver applying his

knowledge to resolve real problems.

These programs for moving knowledge-workers into the educational system must be accompanied by a research program that has three components: (1) research on the effects of heuristic teaching behavior on student learning; (2) research on the measurement of heuristic teaching behavior; (3) research on how heuristic teaching behavior may be learned. Extensive research in these areas is needed because we know so little about complex teaching performances like heuristic teaching, its effects on students, their receptivity to it, which teachers can learn this teaching style, how to train teachers to use it, and what materials and content will be needed to use it.

A research program is needed to assess the effects of introducing knowledge-workers from other fields into the educational system. This change should have substantial effects on the organization of teaching (the amount of responsibility this new kind of teacher will be given and will assume, the nature of their work), the character of teaching and teacher-student interactions, and the curriculum. We need to know what problems these teachers will face, how they adapt to them, and how the innovations they propose work. The system for training these knowledge-workers should be the starting point for a comprehensive program of research and development that will improve the selection and training of these

knowledge-workers, will facilitate their entrance into and retention in the teaching profession, and will support the use of the techniques, programs, and materials they devise for training the next generation of knowledge-workers.

A research and development program is needed to reform certification processes. At present, schools of education are little more than recruiting agencies which take in students, usually by applying no other criteria than those used to select college students, and with little more than a semester of poorly supervised teaching experience and some psychology and methods courses, graduate them into the teaching profession with a teaching certificate. This deplorable system has been denounced, criticized, and attacked for decades and by numerous and varied persons. It has changed very little. If it does not change, the proposals made in this paper cannot be carried out.

Two movements offer some hope for change. There is a movement to base certification on demonstrated teaching performance. To achieve the goals of this movement, research and development is necessary on performance-based measures of teaching competence. The States should be helped to experiment with revising their certification systems, and should be given the necessary research and development funds to mount a program to reform their certification systems.

A second movement is to differentiate the functions of the teacher and to break the teaching role up into its components. Either the teacher's abilities or the nature of the teaching task will be used to assign teachers to those aspects of teaching for which they have the necessary skill and training. Such a system differentiates the teaching staff and provides rewards, opportunities, and responsibilities commensurate with the teaching task or function undertaken.

Both of these movements must succeed if the kinds of knowledge-workers described above are to be moved into the educational system. At present, they could not easily obtain certification nor would they assume a role of the kind proposed for them. They would be required to take traditional teacher training courses and would be assigned traditional teaching tasks. This would be an affront to their knowledge and experience, to their maturity, and to their ability to assume responsibility. This prospect would and does discourage many of them from moving into teaching. If we are to move large numbers of knowledge-workers into our educational system, we must change both the methods of certifying them and the functions they will undertake. We must offer them challenge, opportunity, and responsibility. If we do not move them into our educational system soon and in large numbers, we cannot hope to prepare the knowledge-workers that our society will require.

This paper has proposed that we turn our attention to infusing the educational system in the next decade with large numbers of knowledge-workers to meet the demands of a knowledge-economy and the needs of a knowledge-society. I have argued that unless we do so [illegible] will not solve the problems of this emerging society nor will we capitalize on its potential for growth.

These knowledge-workers will reorient the educational system so that it emphasizes problem solving, learning inquiry skills, and applying knowledge systematically to solving problems. They will devise heuristic teaching styles and the methods and materials necessary to use such styles. We cannot train a generation of knowledge-workers if the only teaching methods used in the schools emphasize didactic teaching styles.

Changes of the kind proposed need three kinds of research and development: research and development on heuristic teaching styles and problem solving teaching performances and their effects; research and development on the measurement of heuristic teaching behavior; and research on learning heuristic teaching behavior. We need research also on how knowledge-workers may be retrained to enter the educational system, how they adapt to it, how their entrance into it changes the system, and how the innovations they propose work.

Changes of this kind cannot be accomplished if we do not change the system for certifying teachers and the character of the teaching role. The States should be helped to reform their programs and school systems and training institutions should be stimulated to modify the teaching role and to train individuals to carry out specific teaching functions in staffs composed of individuals of diverse skills and responsibilities.

The educational system needs reorientation. It must shift to educating children for a society that is emerging, one with which we have had little experience, and one that will require many changes in how we organize the world of work and our other social systems. We are becoming a knowledge-society. The educational system must prepare our children to live in that society and to nourish it. It must prepare them to understand it and to develop and control it. The proposals made here are designed to change the educational system quickly to meet these challenges.

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CREDIT BY EXAMINATION AND THE EXTERNAL DEGREE*

Robert J. Solomon and John R. Valley

Educational Testing Service

The time may be ripe for the widespread introduction of programs supporting independent study and credit by examination and the development of systems by which unaffiliated students--those not classified as regularly enrolled--can achieve the undergraduate associate and baccalaureate degrees, and perhaps professional and graduate degrees as well. There is reason to believe that when all the details of external degree programs have been worked through by educational leaders the opportunities afforded by such programs will be perceived as applying not only to adults but also to many students who move without interruption from secondary to higher education. It may seem ironic that, at a time when we can foresee the advent of universal higher education, we should also contemplate an equivalency system that will greatly expand credit by examination for all students, both enrolled and unaffiliated, and for the latter, offer a new route to a college degree. However, there is no incongruity. Such a

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* Prepared for the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives.

system would be the natural extension of the movement to expand the opportunities for higher education and the higher educational credential.

Historically, higher education in the United States has been closely linked to the social demand for professional and occupational training and advancement. The traditional credentialing system based on course credits and earned degrees was a way to produce recognizably qualified people. Yet we have known for a long time that the traditional system produces strikingly uneven results: the degrees awarded by some colleges are educational light-years from those of their presumed peers. Now as we move into an era in which the traditional credential is losing its special currency because it is more readily available, there may be an opportunity to revitalize the credential and at the same time to allow greater freedom and variety in achieving it. Perhaps if we are completely successful in this regard, we may even create new credentials that will be the preferred or esteemed degrees.

While the external degree and credit by examination are not new ideas, these ideas have not been fully developed in the college community. The fine print in many college catalogs promises credit to the ambitious college student, often by departmental

examination, for knowledge that may have been acquired by non-traditional means. In most colleges, however, it is easier for the student to repeat a subject than to survive the academic obstacle course required for credit. The one widespread notable exception to this distrust of credit by examination is the College Board sponsored Advanced Placement Program. College faculties have accepted this program because they must admit, on the basis of evidence, that bright high school students can do college work outside college. However, there is a catch: for advanced placement in college the high school student must have taken an Advanced Placement course. The only radical departure in this case is the shift of the traditional college course to the high school.

There are at present, however, social forces both inside and outside colleges that may create the appropriate climate for change. One is the changing nature of higher education itself. For example, under pressure from students, faculty, and administrators who have come to recognize that course credits are not necessarily the best way to produce educated men and women, independent study within the college has grown in popularity. In many colleges today it is no longer unusual for upperclassmen to devote most or all the school year to academic work outside the traditional course structure, guided in reading and studying

by their interests and their faculty advisors. Credit for such independent study may be based on a senior thesis or comprehensive.

Where the college arranges for the learning experiences of students to take place off campus--in community agencies, in businesses, in manufacturing plants, etc.,--a dilemma arises. If it grants credit toward a degree for the learning of such students, how can it deny a request for credit from someone who has had quite comparable learning experiences as a regular employee? So the stage is set for the college to be forced to consider at least such a request.

Open admissions may also encourage credit by examination for enrolled college students. To accommodate the greater diversity of students on their campuses, colleges may be more willing than they have been in the past to use examinations to encourage students to move at their own level and pace. In the fall of 1970, as part of its open admissions program, the City University of New York offered credit by examination without regard to courses taken in high school.

Perhaps of equal importance in accelerating the movement to credit by examination and the external degree are various

economic and technological trends. One is simply the increasing costs of formal higher education. On practical grounds colleges may need to find other ways to educate and credential their students than by building expensive facilities and filling them with expensive faculties. Looking beyond the college itself, we are promised a society in which we will have increased leisure time in a multimedia world, which will make it almost seductively easy for the reasonably curious and ambitious to learn. Moreover, the increase in leisure will be the fruit of a technologically based society in which career success may depend increasingly upon an individual's access to continual retraining. Combined, these two trends--available time and the career need for learning--are likely to make continuing education a reality for a large portion of our population.

Finally, concurrent with these developments is the new American revolution of rising expectations among the formerly dispossessed and disadvantaged. For those adults beyond the traditional college age, credit by examination including an external degree is a way of demonstrating that whatever their formal schooling, they are in certain important respects educated men entitled to the social and economic recognition that this society gives to credentialed educated men.

To a significant degree the technology to develop programs in support of independent study, credit by examination and the external degree is already at hand. Such programs will require the means to present the evidence for an individual's college achievement, including his general education both in humanities and sciences. We will need to measure accomplishment in major fields, in individual subjects such as business law or organic chemistry, as well as in combinations of disciplines and systems of knowledge. In addition to paper and pencil gauges, we will need to measure actual performance--a criterion for success even in some college courses--in areas such as accounting, mechanical drawing, or laboratory techniques in basic science. We will need some means to evaluate an individual's actual work experience.

The measurement of achievement at all educational levels is indeed a more sophisticated process in the 1970's than it was 15 or 25 years ago. It is also much more demanding of skills and professional competence than the average faculty member is prepared to admit. Further, we are more keenly aware of the variety of dimensions of individual talent and potential. There is no reason to believe that independent study, credit by examination, and external degrees should be used by all students. If this is the case, a problem will

confront us as to how we might assist students, faculty, and administrators to decide who is ready for credit by examination, who should pursue an external rather than a traditional degree, and when readiness for independent study has been attained. Although not all these techniques now exist, we do know much about how to develop the necessary instruments and procedures.

For the unaffiliated student guidance and counseling will be essential. In this area there is less collective wisdom and experience. One immediate problem will be how to inform unaffiliated students that college credits and degrees are more easily accessible to them, although, as credit by examination becomes commonplace this may be less of a problem. Once we have reached the unaffiliated student, we will need to provide him with ready access to information--publications, guides, and handbooks--and more important perhaps, to counseling centers where knowledgeable people can help him move into an external degree system. It is also quite likely that the unaffiliated student will need such services over time spans that will differ from one individual to another. In part this aspect grows out of our expectation that the time spent by individuals in the pursuit of an external degree might be much more variable than is the case with traditional degrees.

One special problem of awarding external degrees to unaffiliated students is related to the less tangible, less formal outcomes of higher education. Although, in practice, as a society we have always placed great emphasis on the practical, vocational aspects of higher education, we have also believed that higher education is more than a preparation for an occupation, and the college experience itself is more than the sum of courses taken. How will we answer the critic who claims that no set of examinations can ever be equated to the college experience? Will the college experience itself need to be in some way a requirement for the external degree? Will we need to provide some means to affiliate the unaffiliated with an institution? On the other hand, should we and can we find ways to measure for the unaffiliated student his acquisition of the intangibles of the college experience?

There are positive aspects to the problems delineated in the preceding paragraph. There is a good possibility that the external degree may stand for certain kinds of learning experiences that are valued and that the traditional student either may not have had, or having had, they were transitory and left little imprint. We are all too familiar with the fact that for many traditional students the attainment of an undergraduate degree comes automatically upon the accumulation of a prescribed number of course credits. Perhaps the student is asked to relate knowledge, views, or

attitudes from one course to another in his major field, but he seldom confronts problems or issues that cut across courses outside his specialization. It may prove that external degree programs can be structured to assist students in mastering and synthesizing courses of study and incorporating these into their total educational experience by requiring them to demonstrate their mastery of the material. This might come about simply as a practical solution to the problem of what a student who wishes to qualify for an external degree largely via the examination route might be expected to do. Surely we cannot, and we will not, expect such a student to sit through 30 or 40 or more course-bound examinations. More likely we will give students far fewer examinations, but these will be cumulative summaries or syntheses of their learning.

The most difficult problem will be to achieve the commitment of a significant number of reputable, even prestigious, institutions willing to award credit by examination and the degree earned by this route. Unless this is done, our ability to measure college equivalence will mean little. In this regard, we may be able to learn something from the history of the Advanced Placement Program. From the beginning there existed a nucleus of colleges--indeed, a consortium--which in fact awarded placement and credit. Also in the first years of the program these

institutions, through their representatives, participated in determining Advanced Placement policies, procedures, and examinations. On the other hand, in the first year of the New York College Proficiency Examination Program, over 100 collegiate institutions declared their willingness to consider granting credit to students who took the New York State examinations, but in practice this was largely a hollow gesture equivalent to the fine print in college catalogs promising credit by examination. The active dedicated commitment of the colleges is essential to the success of credit by examination and the external degree.

There exist at present the beginnings of a credit by examination, external-degree program. There are several testing programs with instruments that could be used to create a national program. In the early 1960's Educational Testing Service initiated the Comprehensive College Tests. Now, with the support of the Carnegie Corporation and under the auspices of the College Entrance Examination Board, this program has become the College-Level Examination Program (CLEP). CLEP now has examinations in 28 different subjects ranging, for example, from American Government to Computers and Data Processing. A number of additional subject examinations are in various stages of development, including four that measure achievement in college-level medical technology courses. CLEP also includes a battery of five General

Examinations designed to measure the general education of an individual compared with that of a regularly enrolled student who has successfully completed two years of undergraduate study. Between two other national testing programs--the Undergraduate Program and the Graduate Record Examinations--more than two dozen examinations are available for majors in all the more popular undergraduate liberal arts fields, such as history, and in some professional fields, such as business. In addition, through research we have learned how to obtain biographical and experiential information useful in evaluating individual accomplishments. And in the area of performance, the "in-basket" test is one of several techniques for simulating working situations.

CLEP is achieving increasing success. Several colleges are actively using it to award credit by examination: American University in Washington, D.C., for example, has awarded up to a full year of academic credit based on these tests. The University of Iowa will award up to eight hours of credit for four of five General Examinations. CLEP has also been used outside the academic community. The United States Armed Forces Institute's need for college equivalency tests was one reason USAFI first developed the forerunner of the College-Level Examinations, and USAFI is today one of the largest users of the

College Board's program. Of encouraging significance for the further development of credit by examination and external degree programs is the fact that among servicemen tested through USAFI, several thousand test scores equaled or exceeded the credit level recommended for the tests by the Commission on Accreditation of Service Experiences of the American Council on Education. In addition, the state boards of bar examiners in Florida and Georgia, the Indiana Library Certification Board, the Pennsylvania and California state boards for the examination of public accountants and the Port of New York Authority have made use of CLEP to measure college equivalency. But there still remains the immediate need for commitment by a significant number of institutions to adopt procedures that would enable competent and ambitious individuals to earn a degree without perhaps taking a single formal course in an institution.

Critical Issues

In a very important sense the current major roadblock to the further development of external degree programs is the necessity to expose to close examination a series of critical issues. There is, indeed, a gap between credit by examination and the external degree as abstractions and sound operational programs. Most of the issues are particularly difficult because they are concerned with what should be done. For example: Where should

external degree programs be based? Should the external degree be built into existing college and university operations? If so, should all colleges be encouraged to develop their own variation of such a program. Should existing state agencies or instrumentalities be used as the base for external degree programs? Does the external degree represent something that either existing or newly created consortia of institutions should develop? Do we need national programs and new national institutions, agencies, or instrumentalities to provide external degrees?

In addition to the above questions, there are constellations of issues. What is a sensible schedule for the development of programs? That is, what are the priorities of needs? What criteria should apply in assessing these priorities? Should the focus of early programs be on service to adults? Should the needs of regular college students be given preference? Are we more capable of delivering or initiating certain programs earlier than others? Are the priorities the same in all parts of the country or at all levels of society?

How closely should external degree programs parallel or relate to regular degree programs? What does a regular degree stand for? What should an external degree stand for? What protections do we need to build into external degree programs to ensure that

the delicate balance between high quality and reasonable standards is attained? Do we need new organization or new institutions to protect the public interest in external degree programs? How can we bring the proprietary educational resources into the service of external degree programs? How can the concept of an external degree be used so as to expand curricular flexibility at the undergraduate and graduate levels?

What are the instructional resources that are available for external degrees? How can we inventory and appraise the worth of all the instructional materials that have already been developed--the materials that already exist on film, videotape, cassettes, records? What mechanism do we need to determine what additional materials are needed or where they can be obtained? How do we bring these new instructional resources to the student at reasonable cost? How can we make sure that in our use of modern technology, we will not dehumanize the independent learner?

Are there needs for forms of recognition other than course credits and academic degrees? Is the concept of credit by examination equally valid at all educational levels--how viable is the idea at the high school level, at the graduate and

professional level? What credentialing arrangements are most appropriate for postsecondary, vocational, and technical achievements?

What are all of the means at our disposal for assembling evidence of individual learning and achievement? While this paper has given primary emphasis to credit by examination, the authors do not believe that examinations should constitute the only means for demonstrating achievement. What can be done by way of applying the concept of accreditation to this process? How can we systematize the recording, the analysis, and the appraisal of work experience? Do the techniques used to appraise military service, training, and education have broader applications to the civilian components of our society?

The perceptive reader will also note that practically every one of the issues has educational, economic, or political overtones. This does not argue for not developing credit by examination and external degree programs. It merely argues for moving responsibly and carefully.

Some External Degree Models

Those who would contemplate establishing external degree programs should be aware that there are many different designs for such

programs. Several have been tried abroad--for example, the University of London and the recently established British Open University. Some programs have been in operation in this country for several years--at Oklahoma University, Goddard College, Roosevelt University, Syracuse University, and other institutions. New operational programs have just recently been announced by Brigham Young University, and the State University of New York College at Brockport. Other programs such as the Regents of the State of New York and the National College, Inc., are on the drawing boards and they are accompanied by a serious intent to implement them as soon as all the necessary mechanisms can be assembled. A careful study of all of these programs will reveal that the word external as used in external degree has significantly different meanings. In some of these programs the instruction can be external to the central or degree-granting authority. And the range of possibilities in this dimension is tremendous. At one extreme the individual student can be responsible for somehow assembling the instruction or arranging for the teaching-learning experiences he needs--by going to the library, buying books, visiting museums, responding attentively to life around him. And when he has done this to his own satisfaction, he presents himself for examination. If he is successful, he is then appropriately credentialed.

At the other extreme, while the central or degree-granting authority provides the instruction, it does so off campus. The instruction may therefore be offered via correspondence, by television, by cassettes, or by combinations of these. The clue to understanding external in this instance is not the absence of a live instructor. In some instances the instructor may go to a business or a manufacturing plant and offer the live course off campus. The instructional program of the Polaris submarine crews involves many combinations of external forms of instruction.

Certainly another connotation for external is that which pertains to the locus of the examining, appraising, or assessing authority. High school students who participate in the Advanced Placement Program take external examinations. That is, Advanced Placement Examinations, prepared by ETS for the College Board, are made available annually to students prepared in high school who are seeking college credit. When the New York Regents' external degree program becomes operational, we will see people being certified for a degree by an educational authority that does not itself offer the instruction leading to its degree.

Another model that has been recently described would call for the creation of a new institution--a national university--that in its own right could offer degrees based on examinations and that could

offer external degrees jointly with regular colleges and universities that elect to cooperate with it. The suggested design would not have this new institution competing with existing instructional resources but instead it would try to encourage the use of these resources in the service of the independent learner. At the same time, since the national university would have independent learners as one of its primary clientele groups, it would arrange for the special kinds of guidance, counseling, and advisory services such individuals need. It would also establish arrangements for the banking of all varieties of records of educational achievement and systems whereby the individual could draw on these services over time, as needed for his career and personal development.

Some Concerns

During the course of the last year or so we have noted a surge of interest in credit by examination and external degree programs. Many factors have contributed to this enthusiasm including the fact that the British Open University has become operational. In addition, several responsible educational leaders such as Ewald B. Nyquist, Commissioner of Education, New York, and Alan Pifer, President of the Carnegie Corporation have taken public positions in favor of the development. More recently, with foundation support The State University of New York

and the New York Education Department have announced plans for experimenting with the external degree.

At the same time we cannot help but be concerned about the possibility that some of the interest may simply reflect the fact that the external degree may be the most recent or current educational fad. Educational innovation of any variety, and the external degree is no exception, attracts some whose predilections are for the "in-thing" no matter what its shape or form. As higher educational institutions feel the tight financial pinch, there will be greater pressures to respond favorably to external degree programs exclusively for financial reasons. Under these circumstances the full educational potential may not be realized. There is a fairly good yardstick for sorting out the Johnny-come-latelies to the external degree from those who wish to deal responsibly with this concept. The former regard the concept as intrinsically simple and sense no problems whatsoever to implementing programs very quickly.

It would indeed be all-too easy to create a crop of diploma mills in the 1970's unless we are very alert to this danger. There is a public skepticism that will act as a brake on the development of such programs, yet this skepticism will not be sufficient to prevent them. Deliberate action must be taken to design and implement high quality, educationally sound programs.

At the same time, we need to be sensitive to the fact that "high standards" will be used as a dodge to frustrate the development of sound credit by examination and external degree programs. CLEP has already met, and not solved, the problem of the faculty member who refuses to grant credit by examination because "the student didn't take my course,"--or rejection of credit by examination by entire institutions because of the unsupported claim to uniqueness of method or purpose, or objectives, or goals, or students, or faculty, etc.

Next Steps

Up to this point, this paper, in broad outline, has developed the argument that credit by examination and the external degree are concepts that merit careful and responsible development, that there is widespread and growing interest, and that in many quarters individuals and institutions are prepared to establish such programs. How can we proceed?

In January 1971 the establishment of a national Commission on Non-Traditional Study was announced, under the chairmanship of Samuel B. Gould, Chancellor-Emeritus, University of the State of New York. The Commission is sponsored jointly by the College Entrance Examination Board and Educational Testing Service. It is being supported for a two-year period by a grant from the

Carnegie Corporation. The Commission's task will be to assay the opportunities for learning out of school at the postsecondary level and to make recommendations with respect generally to the nature of further development of these opportunities and specifically to the mechanisms for providing formal (academic) recognition for such study, including explicitly at the earliest possible date recommendations with respect to the development of external degree programs in the United States. The Commission will bring a national perspective in the public interest to the rational development of external degree programs and the maintenance of academic standards in them.

With respect to non-traditional study at the postsecondary level, the Commission's effort would involve:

—an analysis of the variety of opportunities now available for such study and of the possibilities of extending them;

—an exploration of the auspices under which credit for such study is being or could be awarded;

—an evaluation of the need for a coordinated national effort to promote and service the concept of learning out of school; and

—the development of recommendations for exploiting existing opportunities and viable new possibilities in fulfillment of the need in ways which will ensure the awarding of credit.

With respect to the external degree, the Commission's function would include the following:

—an analysis of the proposals which have been and are now being made for external degree programs;

—an exploration of the auspices under which such degrees can be and are being granted, including institutional, state, and federal auspices;

—the design of a limited number of specific models for the awarding of such degrees, based on examinations and/or other sources of evidence, including a national model;

—the development of procedures and standards for such awards.

Concurrently with the establishment of the Commission, CEEB and ETS have taken an additional step that deserves the attention of the educational community at large. A jointly sponsored Office of External Degree Plans has been established to support external degree programs generated under the sponsorship of other agencies and institutions. In its early phase the office will be concerned with coordinating the existing examination offerings of ETS and CEEB and bringing these into the service of external degree programs. The office will also offer advisory services to institutions and other educational authorities and consulting services to business and government. Later the office might--depending upon the findings and recommendations of the Commission on Non-Traditional Study--arrange for the counseling

of individuals and their referral to independent study resources, the accreditation of independent study experiences, and perhaps the preparation of study guides.

We believe that through the Office of External Degree Plans and the Commission on Non-Traditional Study the mechanisms have been created to service both the immediate and the long-range development of educationally sound opportunities based on credit by examination and the external degree.

MEETING THE MEASUREMENT NEEDS OF EDUCATION*

William W. Turnbull

Educational Testing Service

Although Charles Dickens is not my favorite author, I should like to begin this paper by recalling to your mind those well-known lines from A Tale of Two Cities,

> "It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity ....."
>
> Charles Dickens, 1859

If Dickens had not written those words more than 100 years ago, someone would no doubt be coining them today. For we are living in a time that combines the best with the worst, the wise with the foolish, faith with skepticism. Perhaps this is part of the human condition. Each generation (gap or no gap) tends to believe that its own era represents the most remarkable advances and the most threatening problems of any time in history. And each generation in its turn may in fact be right.

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* Adapted for the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives from an invited address delivered to Division D of the American Educational Research Association, on February 6, 1971, at the New York Hilton Hotel, New York City.

My topic--"Meeting the Measurement Needs of Education"--reminds me of Dickens' words because both education and measurement currently illustrate the paradox he implied. Despite the affluence of our society, we have not provided equal educational opportunities for all our children. Despite our success in providing examples of outstanding educational programs and sophisticated measurement techniques, we find them coexisting with substandard educational conditions and primitive measurement methods.

In approaching the topic of education's measurement needs, I should like to put forward three propositions that may suggest a strategy for meeting the needs, and then use specific examples from two particular areas of need to try to illustrate the more general points.

The first proposition may be introduced by recalling a famous scene. When Gertrude Stein was on her death bed, it is said, Alice B. Toklas leaned toward her and whispered, "Gertrude, what is the answer?" To which Gertrude Stein whispered faintly, "Alice, what is the question?"

In some ways, educational measurement has been a collection of partial answers in search of plausibly related questions. We

have had a technology--a bag of tricks-- and have looked to see where it might be useful.

Those of us concerned with educational measurement have had no monopoly, certainly, on this approach. How often, for instance, have you heard educators muttering about the manufacturers of devices of all kinds from slide projectors to computers, tailored for use in a general market or a business setting, and sold to schools without modification. The fact that these gadgets work tolerably well in the schools is the justification. The fact that they do not quite fit the specific educational need, we say, is unfortunate but cannot be helped.

In the early stages of any technology, it is perhaps inevitable that we will work from our solutions to our problems. If you give a small boy a hammer, he will find that a great many things need pounding. I would propose that measurement should have passed that stage. We are now possessed of enough techniques and principles to allow us to turn with more confidence to the important real-world educational problems and tackle them, inventing new methods where they are needed to perform a satisfactory measurement function. This is not to say that we have a complete array of answers, but rather to propose that we have reached a stage at which we can and should choose the

questions for their intrinsic importance rather than for their convenience of fit to the answers we have.

My second proposition is rather obvious and I will not elaborate it, but will simply remind all of us that education's measurement needs in the decade of the seventies are, of course, a special subset of the needs of education itself. They will be defined by the directions in which education moves. And education's needs, in turn, reflect the changing social order in which it is embedded. Education, along with the social fabric of which it is a part, is undergoing wrenching changes in the expectations held for it and in the pressures placed upon it. The temper of the times is demanding, and the new requirements for measurement are exciting if not overwhelming.

My first two propositions, taken together, suggest that measurement people have an opportunity and a responsibility to apply their knowledge to the solution of major problems in education and, thereby, in the society at large. The importance of this moment in history is that the knowledge and techniques available were never more sophisticated, and the problems never more urgent. Meeting the measurement needs of education is not only a stimulating intellectual pursuit: it is also a social imperative.

It follows, I believe, from what I have said that the developments in measurement must be embedded in, and integral to, broad approaches to effecting change in education itself. This statement brings me to my third proposition, which is that we cannot by ourselves bring about the needed new developments. I am not in any way denying the importance of the new insights that will surely be developed within the discipline of educational measurement itself. My point is that most of the important real-world problems we are being called on to tackle will yield only to multi-faceted, multi-disciplinary attack. The problems are not rooted in any one discipline but in society and the answers will not be developed within a single discipline either. We who are working in educational research are going to have to move on education's problems in concert with the sociologists, the mathematicians, the linguists, the demographers--not simply to apply what each discipline can now bring to the problem, but to acquire new insights and devise new techniques from the interactive process.

These three propositions about a strategy for the seventies need to be examined in relation to some specific problems that are with us now and surely will not diminish. I shall concentrate on just two very large ones. The first is in the realm of assessment. The second has to do with education as it relates to

the dispossessed--children in minority or poverty groups.

I. Assessment

First, a few comments in the area of assessment. Each of us in his own way has had occasion to be acutely aware of the skepticism with which large segments of the public view the quality of education in America. A list of the categories into which the skeptics fall is frightening in the extent to which it spans the total society, sliced in different ways: intellectuals, poverty groups, radicals, liberals, students, legislators and taxpayers' groups, to name just a few.

The main points to be made about this crescendo of discontent are two. First, "quality" is in the eye of the beholder. We have made minimal progress toward defining what we want from education--or even the dimensions along which to set our targets--and so we can hardly expect anything but confusion as to where we are and how satisfied we are with our position. If we could state alternative targets with some precision, we could engage in rational discourse about their respective merits and demerits. As it is, all too frequently our debates could be characterized as a semantic swamp.

Second, even if we could define educational goals specifically,

and agree on targets, we are not now able to measure how close we are coming to most of them. Beyond the very simplest objectives, we have no good way to settle the bets.

Is this assessment of our condition too unflattering? Perhaps. I think it is an accurate reflection of the state of educational practice in the overwhelming majority of school districts--and states--across the country. In this respect, it is a fair description of the situation that leads to angry meetings of townspeople, after-midnight sessions of school boards, defeated school bond issues, and prematurely gray superintendents.

This is clearly a complicated, messy area but an area in which educational research and measurement can yield the crucial answers. It is an important one for us to tackle precisely because the questions are central to the concerns of a great many people in education, even though it is not one for which we have many answers at the ready. And it poses a set of issues that should be defined by educational research specialists working in concert with people from several other disciplines.

As a matter of fact, some economists are already at work on parts of the problem. And in some relatively sophisticated communities, we are seeing a confluence of economic and

educational thinking. Cost-effectiveness and PPBS are the watchwords.

Cost-effectiveness concepts are to my mind both important and valid. The first-order problems are purely practical, and they have to do with measurement. Most school systems have no useful measures of the cost of specific educational programs. And they have no indices of the effectiveness of their system in attaining most of the goals the community would espouse for the schools. These are measurement problems--some of the unmet measurement needs of education.

The area of evaluation is, of course, gaining new prominence and importance in measurement circles, and rightly so. At the same time, the economists are developing further a climate of thinking that is hospitable to continuing programs of assessment based on cost-effectiveness approaches. The next step should be to bring together the two streams of development in a deliberate way--to integrate the insights of the two disciplines of economics and educational measurement to produce a new synthesis directed specifically at solving the real-life problems of school districts.

This comment may bring to mind such phenomena as performance

contracting, which is currently enjoying a wave of popularity. The performance contract evaluation and audit functions are indeed examples, at a rather basic level, of areas in which our theory and technique are not very well developed. We have, for example, not done anything systematic about defining domains in which we should look for side effects or defining techniques by which we should look for them. We do not issue reports like this: "The pupils in the special contract classes have gained an average of 1.5 grade equivalents in reading during the year. They have, however, gained a negligible amount in math, their work in science has dropped back, and parents report they are refusing to do the dishes or put out the garbage unless rewarded with transistor radios." We need a much more comprehensive evaluation of the effects of educational experiments, continuous over time and embodying the broader insights of both education and economics.

Such a marriage of two disciplines is, however, only part of the need. We are interested not only in the relation between program and cost, but also in the circumstances in which educational change can occur. And these circumstances are the province not only of the educator and the economist, but of the sociologist, the urbanologist and the political scientist, to name just a few.

Let me take a minute or two to make my point more specific. I am

thinking of the familiar student change model in which educational effect is measured by the amount of student growth that takes place toward a stated goal between pretesting and posttesting. The base line of expected growth is established in advance of some experimental program of education. When the experimental program is to be installed, a new pretest is given. Then the new program is carried out, and a posttest is administered. Again the educational effect is calculated as the gain between pretest and posttest. The efficacy of the experimental program is determined by whether or not the new gain under the experimental condition exceeds the normal gain under the control condition. If the cost of the experimental treatment can be determined and compared with the "normal" cost of education under the control condition, it is possible, at least in theory, to relate cost to effectiveness.

I say in theory because the complications are legion. To illustrate: it may well turn out that the experimental program worked well for one subgroup of the population and not for another. The subgroups may be fairly obvious ones--girls versus boys, younger children versus older, and so on. But who will suggest that we examine separately subgroups based on socioeconomic status or on more subtle taxonomies involving students with positive versus negative self-concept, contrasting cognitive styles, differences on a dimension of dependence-

independence, or interactions among these variables? The point is that some of the most useful hypotheses may come from, say, the insights of medical people or street workers or from personality theory rather than theory of educational research. Or suppose two communities have conducted the same experiment. In one the experimental treatment worked and in the other it did not. Why? Perhaps the nature of the school populations was markedly different in the two towns, or the community support was different, or the overall educational program in which the experiment was embedded varied substantially. Just to canvass the areas in which one might look for answers that call for inter-community comparisons suggests that we should call on the expertise of a variety of social and behavioral scientists to contribute hypotheses.

It is my belief that a continuing, long-term program of the kind I have described, drawing on the contributions of specialists from many fields, should become a standard feature of America's educational communities. Measurement is at its core, and yet it is not enough for the measurement fraternity to develop the means of assessment. Our work must be integral to a larger effort that is focussed on the problem and ignores the boundaries of discipline.

II. Minority/poverty students

Let me turn, for my other example, to the formidable question of education's measurement needs as they relate to children of poverty and of the minority communities generally. Here, surely, we have a prime instance of a social and educational problem that commands our attention and our energies. The fact that our theory and our data are inadequate means we will tackle the problems with less precision than we would like, but again, we have to move on the problems that are important rather than on those for which our techniques are best suited. And we who are engaged in educational research cannot solve these problems by ourselves.

I should like to illustrate this thesis by looking particularly at just one aspect of the problem: devising a set of arrangements through which young people from the ghetto can pursue their education beyond high school if they want to.

This question is one to which a great deal of attention has been given by people concerned with guidance, those concerned with testing programs, those involved in college admissions, people working with curriculum, financial aid officers and research people. Their attention and their concern are warranted and valuable. The conclusion I have reached, however, is that the

problem is simply not going to be solved the way we are going at it. The reason is that each of these groups is working conscientiously at its own part of the job but without a framework that embraces the other parts needed for a solution.

The fatal flaw in what we are doing is simply that the various approaches, which are individually excellent in many cases, are uncoordinated. Given time, a decade or so, progress is likely to be marked. But we do not have to wait the decade. There is an urgent need for prompt action now to bring about an early and dramatic improvement in the situation, and for new structures that will encourage future changes to take place at a significantly faster rate. It is my belief that a sweeping change is not only desirable but attainable if we mount a concerted and sustained attack on a number of fronts simultaneously, combining the efforts of the several groups concerned with the problem.

What I have in mind might be described as a interlocking, coordinated program of action in six key areas: guidance, testing, admission, financial aid, curriculum, and research. The need within each area is for special new arrangements aimed particularly at solving the problem of access for the minority group student--or for any other student whose school experience has not followed the pattern of solid academic preparation up to

the point of application for college.

It is true, as I have said, that any improvement in any one of the six key areas would be worthwhile in its own right. But the problem is unlikely to be solved to any substantial degree through piecemeal efforts. From the standpoint of effective functioning, each part of the system depends on the presence of the others and in turn helps make them possible. We have here a rare opportunity to create true synergism.

Within an overall plan, there should be room for giving full scope and strong support to the excellent programs now being pursued. And there should be room for the introduction of the widest variety of innovative ideas. The important point is that if any key component is neglected, the whole system will remain ineffective. A barrier at any single point in a channel is sufficient to clog it.

The matter of broadening educational opportunities for minority group students provides, to my mind, a prime illustration of the proposition that most of the important real-world problems we are being called on to tackle will yield only to multi-faceted, multi-disciplinary attack.

The system I am envisioning would rest on a strong and active program of guidance, to help identify and encourage students who would profit from higher education. It would be desirable to have a large number of guidance centers--perhaps 100--throughout the country, related to but not confined to the big cities, to work wholly on the problem of guidance for students from backgrounds of poverty.

It will be pointed out that such guidance is already going on through the schools. True. But it is no secret that guidance resources are spread very thin in the urban schools, and school guidance people would be the first to applaud a strong effort to develop a companion system with which they could work: one with the specialized aim of college access for children of poverty and of the minority communities. It is true also that there are already agencies such as SEEK, Upward Bound, Project Access and others already in being to complement and extend what the schools are doing. A comprehensive system, if it were established, should not compete with such programs but should provide cooperation, support and coordination, where coordination might be helpful and welcomed. The need is to see to it that the various areas of the country are covered systematically with guidance centers focussed on college-going for needy students and those who have special problems centered on race.

In the beginning, the guidance centers would naturally be concerned with students nearing the point of transition from school to college. As the program moved ahead, however, they could be expected to work with children at earlier points in their schooling. By Grade 12, of course, the door to college may have been effectively closed by inadvertent early decisions unless a student has been actively encouraged to keep it open.

Let me sketch briefly the kind of testing pattern I should like to see for these students as they approach entrance to college. The emphasis of the test program should be on helping the student and his counselors understand the range and variety of his abilities and interests, the kinds of college-level work that he might pursue successfully, and the additional preparation he might need to pursue goals for which his training to date had not been adequate. The tests could be taken by any student on a walk-in basis at a guidance center and the interest measures could be completed at home. Practice forms of all materials would be available to all students. Conventional numerical reports would be supplemented by verbal reports that would interpret the numerical record and relate it to the student's interests and educational goals as he expressed them.

All results would be reported first to the student and to the

guidance center. They would be reported to any college upon the student's request after he had had an opportunity to review them and discuss them with his counselors. If the student so requested, his results would be erased completely and never reported.

Accompanying the guidance-oriented testing program for students would be a systematic program through which post-secondary institutions would gather and publish comprehensive descriptions of themselves for the benefit of prospective students.

I have touched on only two of the six components that I think are needed in a comprehensive system for minority students: guidance and testing. Beyond them are four others, which I shall simply mention once again, although each merits extended treatment:

admissions arrangements entered into cooperatively by groups of colleges and the guidance counseling centers, designed to bring about the most successful match between the students and the institutions of higher education.

financial aid in substantial amounts, since it is worse than useless to raise the aspirations of students from backgrounds of poverty if there is no practical way for them to realize their ambitions.

curriculum study and change, both in school and in college, to provide experiences that will keep the student involved in his studies in school and provide him with a college experience that relates to his interests and abilities at the post-secondary level.

research, development and evaluation to be conducted continuously on all aspects of the working system in order to improve it as rapidly as possible and to ensure its continual responsiveness to changes on the educational scene.

I have dwelt at some length on this conception of a single program for needy students, minority group students and those whose preparation is weak, and have done so for two reasons. The first is that it illustrates my main thesis: if we are going to tackle large educational and social problems with any hope of success, we will have to see the measurement job as just one element in a much larger whole that should be conceptualized and attacked in its entirety. In so doing, we will have to work with many people outside the educational research fraternity--politicians, college administrators, guidance counselors, federal officials, organized minority groups, and so on--to weld a coalition of people who are willing to contribute their special knowledge to a common set of purposes. My second reason for outlining the concept is my personal belief that a development of

this kind, while ambitious perhaps, is feasible, necessary, and overdue.

III. Measurement Man's Future Role

In facing the issue of meeting education's measurement needs, I have chosen to look at two such needs in depth rather than to attempt a catalog of what ought to be done. Measurement needs are integral to education's needs. Increasingly, they will be met as we mount successful overall systems of educational reform in which the measurement component is embedded.

In this conception, measurement is not a self-sufficient act. It is part and parcel of efforts to effect educational change. And it is at the heart of many of these efforts. One might say, however, that the measurement person's job will become much harder as it becomes more central. This is so in two respects. First, as measurement assumes a central role in more sophisticated systems, we are going to see the fulfillment of E. B. White's prediction that there is a bright future for complexity. As complexity increases, the job of making the results of measurement readily understandable, and resistant to misunderstanding and misuse, will increase. This is an area where we have been less than resoundingly successful in the past and where redoubled effort will be essential. Second, a special obligation is placed

on the measurement person if we say that the measurement job is not over until the results have been analyzed, simplified, interpreted and put to use. I believe there is no such thing as good measurement that has not been used.

Alfred North Whitehead said, "The vigor of civilized societies is preserved by the widespread sense that high aims are worthwhile."[1] In meeting the measurement needs of education, if we aim high, we may be able to provide the ingredients that are critical in meeting some of the most important needs of education and in so doing help preserve the vigor of the larger society.

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1 Whitehead, A. N., Adventures of Ideas (Cambridge University Press, or The Macmillan Co., New York, 1933) p. 371.