DOCUMENT RESUME

ED 202 497 JC 810 230

AUTHOR Cross, K. Patricia
TITLE On Old Practices and New Purposes in Education.
PUB DATE 9 Apr 81
NOTE 25p.; Paper presented at the Conference on Remedial and Developmental Mathematics in College: Issues and Innovations (New York, NY, April 9-11, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Standards; Access to Education; Community Colleges; Computer Assisted Instruction; Educational Finance; Educational Objectives; Educational Quality; Educational Trends; Individualized Instruction; *Open Enrollment; Semester System; Student Evaluation; Two Year Colleges
IDENTIFIERS Miami Dade Community College FL

ABSTRACT

The dilemma of maintaining academic standards as well as open access policies is discussed in this paper with respect to the causes of and possible solutions to the problem. Trends leading to the standards/open access dilemma are first considered, including the dominant belief in the 1950's that education served to select and groom the most academically talented students; the efforts undertaken in the 1960's and 1970's to change this elitism by stressing open access to education; and the concurrent deterioration of academic standards. The paper then looks at current disillusionment with open access policies and examines the failure of colleges to change common educational practices that cannot adequately deal with the wide variety of skill levels possessed by today's student body. As an example, the paper details the inability of fixed semester and letter grading systems to accommodate the varying learning rates of students and to motivate them toward success. The remainder of the paper discusses the efforts of Miami-Dade Community College to provide an instructional program incorporating both standards and open access policies. These efforts include the placement of students at a level that offers them realistic chances for success; the use of computers to monitor student progress and to provide feedback; the enforcement of academic warnings and suspensions; and the development of a state funding formula based on clock rather than credit hours. (JP)

ON OLD PRACTICES AND NEW PURPOSES IN EDUCATION

K. Patricia Cross
Harvard University

Paper presented at the Conference on Remedial and Developmental Mathematics in College: Issues and Innovations
(New York, NY, April 9-11, 1981)

ON OLD PRACTICES AND NEW PURPOSES IN EDUCATION

K. Patricia Cross

Harvard Graduate School of Education

This is a strange decade for American higher education. It seems to separate two vastly different moods. We can look back at the 1950s and 60s and see a period of high optimism, exuberance, and self confidence in colleges across the nation. The final report of the Carnegie Commission (1973) called these years the Golden Age of Higher Education. Looking ahead to the 1980s and 90s, many educators, if not downright pessimistic, are at least not optimistic about the future. The years immediately ahead have been referred to as a "time of troubles" by the Carnegie Commission, and they do indeed seem to be full of problems -- with steady state enrollments, taxpayers' revolts, faculty retrenchment, the search for meaning in the curriculum, and changes in federal and state priorities.

I don't wish to be a "Pollyanna" about some of the troubles that lie ahead; they seem at times about to overwhelm us. But a few decades of respite from the expansionist activities that char-

---

Presented to the"Conference on Remedial and Developmental Mathematics i College: Issues and Innovations," New York City, April 9, 1981.

acterized the Golden Age may ultimately strengthen our educational system. Perhaps the nation as a whole, but educators in particular, need to take some time to reflect on the purposes and priorities of higher education.

One of the things that I think we will discover is that traditional practices in education are increasingly incompatible with our new purposes. The purposes of higher education have changed substantially over the last couple of decades, but our practices, especially those related to instruction, have remained essentially unchanged for centuries. Clark Kerr (1976) has quite rightly observed that, "You could go back to the University of Bologna in the twelfth century and feel more or less at home."

As recently as the 1950s, the perceived purpose of higher education in the United States was to select and educate young people who had already demonstrated their ability to learn what colleges were prepared to teach. In those post-World War II years, the demand for education greatly exceeded the supply, and a strange thing happened to higher education. Institutional reputations were built, not on the quality of the education received, but on how hard it was to gain entrance. Moreover, those who got in were already among the best educated young people in the nation. Looking back, it seems an odd assignment for public education to be more concerned about selection than about education and to spend the most educational dollars on those who needed it least. From

the perspective of the times, however, the task was not to provide college education for the masses; indeed, President Truman's Advisory Commission on Higher Education estimated that only one-third of the population had the ability to profit from a college education. The task, as society saw it in the 1950s, was to select those who had already demonstrated their academic ability and tc educate them for positions of leadership. Given this purpose, the social challenges were few and the pedagogical challenges minimal. Those in government who formulated social policy worked on merit scholarships to assure that highly able high school students were identified and honored with scholarships that bore no relationship to financial need. Administrators devoted their talents to building campuses and research reputations, and faculty in the "best" colleges where admissions offices had screened out the hard-to-teach, had an easy job teaching students who were most likely to succeed at tasks that colleges thought were important. In those public colleges where acceptance of all high school graduates was required, faculty performed the selection duties by washing out large numbers of students after the freshman year. "Accountability" was an unknown concept, and students who failed to make good academic progress simply proved the wisdom of the Truman Commission's conclusion that only a third of the young people in the nation were "college material."

This generalized portrait of higher education in the 1950s is not meant to suggest that faculty were not serious and conscien-

tious about their jobs, or that colleges were vindictively interested in getting rid of students who made teaching difficult. Nor should we forget those sturdy, usually small, often isolated colleges that remained true to the teaching function through rather dramatic shifts in nationwide priorities. But, by and large, the perceived national purpose of higher education in the 1950s was very different from what it is today, and people, then as now, tried to act in accordance with what they perceived the purposes of their institutions to be.

Today, almost anyone can and does go to college. Ninety-nine percent of the community colleges and nearly half of the four-year institutions in this country are open-admissions colleges (Roueche and Snow, 1977). There is relatively little selectivity left in higher education. Over the short time span of two decades, post-secondary education has replaced a comfortable homogeneity of selected students with an uncomfortable heterogeneity. Students today enter colleges from the ghetto, the barrio, the reservation, and the suburbs; they are 20, 30, and even 70 years of age; there are women preparing for lifetime careers, faltering students unsure of their academic skills, hopeful students - the first in their families ever to attend college. Having waged a vigorous campaign for equal access throughout the 1950s and 60s, society now expects colleges to go beyond mere access to make college for the masses something more than a hollow victory.

But how are we going to accomplish that enormous task?

Twenty years ago, John Gardner asked, "Can we be equal and excellent too?" We are still struggling with the answer to that question. In the 1960s and 70s we concentrated on trying to bring about equality; it looks as though we are going to spend the 1980s and 90s concentrating on quality. Whether we can bring the two together remains to be seen.

In the climate of the 1980s, there is the temptation to correct the excesses of the 1960s and 70s with a violent swing of the pendulum in the opposite direction. There are some who, having concluded that we have given open access a good try, would close the door on access and turn now to the reinstatement of standards. That's only fair, they claim, since the proponents of access turned their backs on standards in the 1970s in a single-minded dedication to the cause of open access. All of us are familiar with the litany of excesses that took place in the 1970s, most of it not directly related to equal access, but catching a spirit that valued acceptance and tolerance over standards and value judgments. Requirements disappeared from the curriculum; testing even for purposes of guidance and placement became a no-no; there was a hesitancy to enforce demands upon students, and inflated grades devalued the currency of college credit. In retrospect, I am convinced that the pendulum had to swing too far in order to accomplish the Number One priority which was to open the gates of colleges to all who wished to learn. The problem came when we lost sight of the purpose of access -- which was not merely

to permit students to enter colleges but to enable them to learn.

We need not make the choice between equality and quality; we can have both. Indeed, it might be said that there is no true equality until each student is offered the right to do his or her best. Sad to say, we have not been offering that right to either high-achieving or low-achieving students. Denial of the opportunity to take pride in one's accomplishments is a serious infringement on educational rights. And where standards have been compromised, students are denied the very basic human right to feel good about themselves and their accomplishments. I am convinced that we can return pride in achievement to education without compromising the gains that we have made with respect to access. But to do so will require major changes in the traditional practices of education -- changes in our most basic premises about teaching and learning.

Education has adapted fairly well to change in administrative procedures. People who were frantically busy with change during the 1960s were college administrators and the administrative officers of federal and state agencies. Financial aid, admissions, recruitment, orientation, and counselling occur in the administrative offices of colleges. And there is evidence that the practices and procedures of these offices changed substantially throughout the 1960s. In 1970 when I conducted my first survey of community college programs, which bore the brunt of the new social priorities, I found that the overwhelming majority of the community col-

leges had already devised special programs and procedures for helping students gain access to post-secondary education. Virtually no administrative office was doing things as they had done them in the 1950s. But very significantly, I found that the influx of poorly prepared students into colleges had made very little impact on instructional programs up to 1970 (Cross, 1976).

But in 1970 the tide began to shift. There was marked attention to teaching practices. Teaching methods changed perceptably as learning laboratories, competence-based education, self-paced learning, and media-assisted instruction began to appear on the scene, but there were also efforts made to improve traditional classroom teaching. Between 1970 and 1975, more than a thousand colleges and universities instituted new activities designed to help faculty members improve their teaching (Centra, 1976). I anticipate that pressures will continue to build for substantial improvement in the instructional practices of education. But once it is clear that teachers are doing their best in a system that is ill-suited to the new challenges, we will have to look to reform of basic educational structures. In the words of Bob McCabe (1978), President of Miami-Dade Community College, "Nothing can be more frustrating than for faculty to develop a well-conceived and economically feasible plan for learning, only to find that the management systems are not designed to accommodate it."

That has been largely the case with individualized learning,

which, although it seems especially well suited to today's enormously diverse college population, is perpetually thwarted by such outmoded practices as semesters, credit-hour funding, and faculty-load formulas.

Let us look for a moment at an educational practice that is so familiar to all of us that we rarely question its appropriateness in the new world that higher education has become. The semester, or any other time unit with fixed boundaries, makes some assumptions about learning that we know are false. It assumes that the time required for learning is the same for all people and for all subjects. That premise, which is the foundation upon which the present structure of education is built, is so blatantly untrue that we don't even bother to document with research our personal experiences. As an undergraduate math major, it was very clear to me that I learned mathematics much more quickly than I learned history, and it was equally clear to me that I was not going to complete a semester of history with the same mastery of the subject matter as some of my fellow students. The imbalance was greatly exacerbated by the fact that because I was successful in mathematics, I was motivated and eager to spend out-of-class hours on it, whereas my progress in history was such that the history book spent most evenings and weekends in my school locker. The big plus for me in history came at the end of the semester when the used bookstore told me that my history book was worth more money than my math book because it was

in better condition. Incidentally, now that I am free to set my own pace, I read history for pleasure -- which suggests that my early distaste for history was not an innate or incurable affliction.

We do know from research that the time people spend directly on the learning task is a critical variable in learning. We also know that motivation and success are intimately related. We are more highly motivated to do those things that we do well, and this creates an upward spiral in which we become ever more proficient in the areas of our success. Unfortunately, the downward spiral is more often experienced by many underprepared students in school-related tasks. Research shows that low-achieving high school seniors are significantly more likely than high achievers to spend their time in non-school related activities (Cross, 1971). Less time on task means lowered success, lowered reward, and therefore less time on school learning. This simple fact of life explains in large measure the consistent research findings that show that as students proceed through school, the gap between high achievers and low achievers widens.

There is a rule of thumb that says that the range of academic achievement in a given class of unselected students is roughly comparable to the grade level at which the measure is taken. For example, in the third grade most students will be reading at the third grade level -- by definition. But we are quite likely to find some students reading at the second grade and some at the fourth grade level, making an effective span of three grade levels

in student achievement. By the time students get to college, that gap has widened so much that it is not unusual to find a span of ten or twelve years in the freshman class of an open-admissions college; some students will have fourth grade reading abilities while others will be reading at the level of the average junior or senior in college. To expect any classroom teacher to deal effectively with that span of achievement under the constraints of group instruction and fixed time boundaries such as semesters, is totally unrealistic. It hasn't worked, and there is absolutely no reason to hope that it will work.

What to do? Most people have no quarrel with the ideal of individualization. They readily admit that if instruction could be geared to the level of each learner, and prescriptions could be designed to address individual academic weaknesses, learning would be greatly enhanced across the full range of student abilities. It is the practicality of individualization that stops people -- especially those that live in the real world of fiscal austerity, Propositions 13 and 2 1/2, and the slashing of the Federal budget.

True, individualization has been adopted in many forms by teachers working with underprepared students, but they must be not only creative, but devious and dedicated as well, to operate individualized programs in an educational system totally geared to group instruction. It would make sense to give slower learners either more time or less credit if they have not completed

the work by the end of the semester. But instead we indicate through D and F grades that the learning is incomplete -- an approach that does no one any good. It does nothing to motivate the student or instill self-confidence; it passes students on to more advanced work without providing the necessary tools; and it compromises the integrity of education with future employers by turning out functional illiterates. To defend semesters on the grounds of efficiency and cost is to misunderstand the purpose of education -- which is, quite simply, to help all students learn. Somehow, during the 1980s we are going to have to start with the purposes of education and design the practices to support those purposes.

I may be an incurable optimist, but I see some bright light at the end of the tunnel, and I believe that we are going to see some remarkable progress in the 1980s in devising practices that are more appropriate to our new purposes. Let me spend the remaining time today talking about the reason for my optimism which is occurring in a college that I believe is on the verge of achieving a breakthrough in pursuing quality in education without sacrificing open access. If this breakthrough had occurred in a small college located in a stable and affluent community, I might call it a happy situation for the college but I would hardly call it a breakthrough. The fact is that the program I want to talk about is under development at the fifth largest institution of higher education in the nation -- Miami-Dade Community College -- a huge, urban, open-admissions institution set in the heart of

one of America's most rapidly changing cities. Miami-Dade has a highly diverse student body that is forty percent Caucasian, forty percent Hispanic, and seventeen percent Black. The sheer size of the college with a credit enrollment of 44,000 students should make it an unlikely prospect for institution-wide reform, but once the innovators at Miami-Dade set about defining the problems and seeking solutions, one thing led to another, and they now have in place a program that is so far reaching in its way of dealing with many of today's problems that I can only describe it as a breakthrough. This is not to say that Miami-Dade has unleashed a panacea that will solve all the problems of urban open-admissions education; I assure you there is plenty of room for the rest of us to exercise our creative problem solving abilities. But Miami-Dade has opened the door to a glimpse of the future that gives reason for optimism. Although Miami-Dade happens to be a two-year community college, the program they have devised is equally appropriate for four-year institutions, and, as a matter of fact addresses, from a perspective of 20 years experience with open-admissions, some of the problems that four-year colleges are just beginning to experience.

Miami-Dade's program is a comprehensive approach that involves curricular reform, the development of a management system that can support instructional innovation, and the redefinition of faculty roles. Needless to say, it also requires the best problem-solving talents of faculty, administrators, the higher education community in Florida, and state government.

The rock upon which the program rests is the recognition of the value and importance of the individual, and in an institution the size of Miami-Dade, the intelligent use of technology is the key that makes individualization possible. Miami-Dade's program began in [illegible] with the reform of general education. The development of a curriculum that a majority of faculty can agree that all students should take is in itself a formidable undertaking not recommended for the faint-of-heart or the short-of-patience. The process of drafting a document, sending it to faculty for reaction, negotiating changes, redrafting the document, hashing it over in committees of the faculty took three long years. I was privileged to be an observer of the process in those years, and I confess that there were times when I agreed with the staff member who labeled the whole procedure "beyond democracy." The fascinating thing about the review of the general education requirements, however, was the number of questions it raised. If every student was to be required to take five general education courses, what was the common core of knowledge that every degree-seeking student should have, whether planning to be an automobile mechanic or a college professor? If every student is expected to pass the general education requirements, how could the academic integrity of the program be assured in the face of rising numbers of students who lacked the basic skills for success in college level courses? I won't go into the content of the five general education core courses;

suffice it to say that they are being very carefully designed, with the use of media where appropriate, and that they are not watered down representations of the academic departments that had enough political clout and savvy to win the usual battles over distribution requirements. They are truly interdisciplinary courses designed to be useful in all walks of life, with clearly defined competencies that students passing the courses can be expected to have. (See Luckenbill and McCabe, 1978, for a full description of the general education program.) One example, however, will illustrate some of the principles that have been applied to course development. The physical education requirement can be met through either a physical education activities course -- tennis, hockey, or whatever -- or a health improvement course. The super-popular health improvement course begins with a physical stress test, followed by an individualized computerized letter to each student giving test results, assessing strengths and weaknesses, and preparing the student for the course which assumes that the individual must accept responsibility for improving his or her own health. As the saying goes, "Teaching is easy once you have their attention." And relating lessons directly and personally to individual needs is a time-honored way of getting attention.

The health-improvement course makes a good illustration because it embodies the principles of Miami-Dade's comprehensive plan of reform, which is assessment, followed by full information to the student, followed by prescription for what can be done

about it and suggestions about where to get help. One of the features I find especially appealing about the Miami-Dade program is that it places responsibility for improvement upon students, not in a vague way, but by telling them rather directly what might be done, providing the necessary support systems, and then letting students know unequivocally that the college has the expectation that the student is capable of succeeding. One of the characteristics that stands out most clearly in my own research on underprepared students is the need for explicit framing of the problem accompanied by confidence in the student to accomplish the task (Cross, 1971, 1976). Too often, in our dealings with low-achievers, we have lowered our expectations admitting to students as well as to ourselves, that we doubt that the student can succeed. The experience of not succeeding in school is so pervasive for basic skills students that lowered expectations is the last thing they need. Raised expectations, plus the provision of opportunities for experiencing success at a task that is difficult enough to generate a feeling of accomplishment for that student is the prescription I would make for most basic skills students.

That is the prescription that is made in Miami-Dade's new program. When students enter Miami-Dade, their basic level of academic preparation is assessed on tests of reading, writing, and mathematics. The college then assumes the responsibility for providing an appropriate prescription for success for that

student. If the student lacks the basic skills to succeed in the required general education core courses, he or she must first register for the appropriate skills-building programs. Admittedly, there is nothing very different in that step from the placement tests that we all used to take in college, but the concept of course placement disappeared for awhile under the notion that every student had the "right to fail." Most basic skills students, however, are old hands at failure; what they need is the opportunity to succeed. Once the Miami-Dade student is placed at a level that offers realistic opportunity for success, the Academic Alert and Advisement system goes into operation. This is a computerized system, containing information about the student -- test scores, work schedule, academic load, native language, age, etc. -- plus information from instructors about the student's progress in class. Seven weeks into the term, all instructors are asked to provide only two pieces of information -- is performance satisfactory or unsatisfactory and has attendance been satisfactory? That is not a very onerous task and yet the mere requirement forces instructors to get some sense of the progress of each student in his or her class before it is too late to do something about it. Each of Miami-Dade's 40,000 regularly enrolled students gets an individualized letter assessing progress in each course and making suggestions that are consistent with that student's situation -- congratulations if the progress is good, suggestions to see the instructor or an advisor (whose

name and phone number appear in the letter) if progress is in doubt, caution that the student is carrying too heavy a load given low test scores and weak performance, information about next semester's registration, etc. Overall, there are 150 different messages programmed into the computer and when various combinations of messages are considered, it is possible to generate almost 27,000 unique letters if student information so indicates. Lists of potential student load also go to the support services of the college so that basic skills laboratories, academic advisors, and others can plan accordingly. Students and faculty appear well satisfied with the system so far with ninety-three percent of the students and eighty-eight percent of the faculty recommending its continuation. More important, perhaps, are early data demonstrating the potential effectiveness of the plan. In the three years since the system has been in operation, the percentage of students performing satisfactorily at midterm has increased from forty percent to fifty-two percent, and eighty-five percent of the students who received warnings in their academic alert letters at midterm are completing the semester satisfactorily. Furthermore, there has been a significant improvement in the grades of students with poor academic records since the system has been implemented and among students taking advantage of the advisory and support services.

For its part, the college has demonstrated its desire to

help students succeed. It must be obvious to students that the college is working hard to diagnose problems and provide maximum information about student progress, while building support systems with faculty and advisors who are able and willing to help. It must also be clear that standards are in force and that the burden for performance rests with students. In two and a half years, over 8,000 students have been suspended from Miami-Dade but, as students understand that the college is serious about the enforcement of standards, the suspension rate has started to decline. The rate of suspension has declined for all ethnic minorities, but the forty-four percent decline in the number of Black students suspended has been especially striking.

The enforcement of standards and the accompanying more effective monitoring of student learning performance, is handled via another special feature of the Miami-Dade program, the Standards of Academic Progress Program (SOAP). The Standards consist of a successively severe set of actions that may be taken by the college to press the student into assuming responsibility. The first step is academic warning which goes further than the usual ominous words on paper by requiring the student to participate in intervention courses on study skills, career planning, time management, etc. Students are also required to reduce their load,--which incidentally, Miami-Dade is finding a highly significant variable in the performance of basic skills students. The second level in the Standards of Academic Progress program is academic probation which carries further requirements for reduced

load and special help. If the student is still not making satisfactory progress by the time 30 credits have been attempted, he is suspended from the college for a term. The ultimate action is dismissal which carries the message that the college believes that the student is not going to succeed at Miami-Dade and further public investment is unjustified.

I think, and I'm fairly certain that Miami-Dade would agree, that they have just barely scratched the surface with their trail-blazing use of computers to get individualized information in the hands of students. Smaller colleges may be able to come up with more personalized forms of individualization. In one sense, the amazing thing about the Miami-Dade program is that they are able to individualize at all. One of the faculty planners figured out that if they were to use advisors instead of computers, each advisor would have to devote all of his or her working hours for 31 days to seeing students at 15-minute intervals, with no margin for error in scheduling or student failures to keep appointments (Anadam, 1981).

The reason that I say that Miami-Dade has just barely scratched the surface in what needs to be done is that their individualization is at present largely concerned with providing diagnosis, feedback, and prescription to students about their academic progress. That is certainly not inconsequential, but eventually we will have to find ways to individualize the <u>processes</u> of education. Miami-Dade is currently working under a FIPSE grant to

crack the rigidity of semesters and other fixed time boundaries. A solution will no doubt involve reform of funding formulas and negotiations with forces outside the college. But already President McCabe has negotiated an agreement with state fiscal offices to fund remedial work on the basis of clock hours instead of credit hours. The implications are powerful. In the first place, extra assistance can be provided to those students needing help. If, for example, the mathematics department finds some students having difficulty with certain concepts or aspects of the work, departmental faculty may devise an appropriate and workable support system, apply for recognition of it, and receive funding for the hours spent with students needing help. Among other things, the promise of funding encourages faculty to take an interest in learning problems. Learning laboratories can also be funded on the more realistic notion that the hours a student actually spends on the learning task are the relevant educational units. Finally, funding remedial activities on the basis of clock hours is consistent with the new emphasis on standards since it removes any motivation to convert all kinds of learning activities into credit courses in order to receive funding.

I hear your skepticism, which is reaching me in the form of the question, "Fine, but won't such programs cost money?" Yes, of course, but part of the secret lies with the re-allocation of expensive human time. It is estimated, for example, that Miami-Dade is saving $100,000 a year now on a new computerized

method for certifying that graduation requirements have been met -- a system, incidentally, that also removes the drudgery and error present when faculty advisors try to keep up with student changes in programs and changes in prerequisites for admission to upper division institutions.

Although it must be obvious by this time that I think what Miami-Dade is doing is terribly significant, my point in taking time to relate it to you is that it represents a bright vision of the future that is all too rare in this apparently bleak decade. Most of us complain about the quality of academic preparation of entering freshmen; we sincerely want to be able to hold the high expectations that generate pride for both faculty and students; and we bewail the lack of funding that prevents instituting reform, but I draw inspiration and encouragement from this example of what is possible in a large, urban, open-door institution with a heterogeneous and rapidly changing student body. The success formula, as I have watched it over the years at Miami-Dade, seems to be a constructive and creative approach to solving problems that pervades the entire insitution. Once the reform bandwagon is rolling at the rate it is now at Miami-Dade, each problem solved opens a new challenge or suggests a new application with the accompanying sense of excitement and stimulation to all who are a part of it.

I have tried to convey some of this excitement and stimulation to you this morning. In conclusion, I would say, "Yes, John Gardner, we can be equal and excellent too -- but it will

take time, creativity, productive inspiration, cooperation, and most of all the conviction that we can offer quality education and individualization in heterogeneous urban institutions."

References

Anandam, Kamala. "Promises to Keep...Academic Alert and Advisement." Paper prepared at Miami-Dade Community College, March, 1981.

Centra, John. "Faculty Development Priorities in United States Colleges and Universities." Princeton, N.J.: Educational Testing Service, 1976.

Cross, K. Patricia. Accent on Learning. San Francisco: Jossey-Bass, 1976.

Cross, K. Patricia. Beyond the Open Door. San Francisco: Jossey-Bass, 1971.

Kerr, Clark. "Education for Tomorrow: For Whom? Why?" Address presented to the Western Assembly of the College Entrance Examination Board, San Diego, California, January, 1976.

Luckenbill, Jeffrey D. and McCabe, Robert H., General Education in a Changing Society. Dubuque, Iowa: Kendall/Hunt Publishing Co., 1978.

McCabe, Robert H."Academic-Economic Planning Systems." Paper prepared at Miami-Dade Community College, March, 1978.

Roueche, John and Snow, Jerry J. Overcoming Learning Problems. San Francisco: Jossey-Bass, 1977.