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ABSTRACT

In spring 1981, resources were allocated for the establishment of the Center for the Improvement of Teaching and Learning, which would coordinate strategies to improve methods of instruction and learning in the community colleges of the United States. The emphasis of the Center is on the development of strategies that require relatively small changes in teaching methods, but that yield large effects on student learning outcomes. Ideas, methods, and processes are tried first on a pilot basis in one or more colleges and, if the pilot is successful, a demonstration project is conducted at five or six institutions. If the project proves to be educationally and economically sound, findings are made available through publications, workshops, and conferences. Current projects being undertaken by the Center include studies to improve student achievement in the crucial first term of college; an examination of the teaching methods and procedures of particularly effective teachers; the development of mastery learning strategies (that is, those which involve conventional instruction followed by feedback correction procedures); and the study of ways to teach higher mental processes in order to improve learning and information retention. Future directions for the Center include the coordination of projects developed across the country and the establishment of consortia of faculty and administrators to initiate and participate in further studies. (HB)

THE CENTER FOR THE IMPROVEMENT OF TEACHING AND LEARNING: EXPLORING NEW DIRECTIONS IN COMMUNITY COLLEGE RESEARCH

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CENTER FOR THE IMPROVEMENT OF TEACHING AND LEARNING:
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Community colleges have grown rapidly during this century and today represent a major component of post-secondary education in the United States. With more than four and a half million students, community colleges presently enroll 36 percent of all students in higher education and serve over 50 percent of all first-time students in post-secondary schools. Public and private four-year colleges and universities generally restrict admissions on the basis of scholastic aptitude and secondary school records. This leaves "open admission" community colleges as the only institutions of higher education available to students with poorer scholastic aptitudes and school records. Especially in the major urban centers, these are largely minority students who have less than favorable learning conditions during their elementary and secondary school years. Furthermore, community college students are generally older and less financially able, have jobs and family responsibilities, and are less sure of themselves and their academic potential than are their counterparts in four-year colleges and universities. Thus, while community colleges have extended the opportunities of higher education to new sectors of the American public, they are now facing new educational

challenges arising from the needs of such a diverse student population.

Although these challenges are not restricted to community colleges, they are more serious for these institutions. Consider, for example, relative rates of student attrition. In four-year colleges and universities with selective admission policies, about 70 percent of entering students complete their first year and enter a second-year program. In open-admission community colleges, however, figures showing a 50 percent loss of students are not uncommon. In fact, in large urban community college systems, only about a third of first-year students enrolled in two-year programs make it to their second year, and only about one-fifth complete the two-year program. The human and economic losses from this attrition, both for the individuals involved and for society, are incalculable. And sadly, while the absolute number of individuals involved in these figures has changed from decade to decade, the relative rate of attrition from post-secondary education has not changed for much of the twentieth century.

Research on student attrition indicates that a major reason students leave higher education is that they do not have successful learning experiences during the critical first year and, as a result, are discouraged from seeking further learning opportunities. There has been considerable interest over the past decade in identifying and developing favorable learning conditions in institutions of higher

education that enable the large majority of students to have successful learning experiences. As a result of such conditions, most students can develop a very positive view of their own learning capabilities and can be motivated to overcome temporary learning problems in order to complete their original goals and plans for higher education.

A number of recent studies have shown that the teaching-learning strategies associated with "mastery learning" can provide most students with much more favorable learning conditions than are possible with more traditional approaches to instruction. Although there are a number of variations of this approach, all involve conventional group instruction followed by periodic feedback-corrective procedures to bring the majority of students to a high standard of learning for each section of the course. In addition to improving student achievement, these strategies also have been shown to result in increased motivation for further learning and a marked reduction in course attrition rates (Guskey, T.R. and Monsaas, J.A. "Mastery Learning: A Model for Academic Success in Urban Junior Colleges." Research in Higher Education, 1979, 11 (3), 263-274). Mastery learning has been used by over 350 faculty members in over 100 courses in the City Colleges of Chicago. The results of nearly eight years of experience with this approach have shown that when the mastery learning strategies are used appropriately, about 80 percent of students in a course achieve at the same high level as the highest 20 percent of students in the same

course taught by conventional methods.

At a recent conference on mastery learning sponsored by the City Colleges of Chicago, faculty teams from twelve major community college systems learned how to use mastery learning strategies and viewed mastery learning materials developed for specific courses by City Colleges of Chicago faculty members. These faculty teams left the conference with plans for trying these strategies in their own courses and then providing leadership in the training of other faculty members at their colleges. The success of this conference has led to the planning of similar conferences to help other faculty teams interested in the application of mastery learning strategies.

Development of the Center

While mastery learning has proven to be very useful for community colleges and the clientele they serve, it is likely that no single approach to instructional improvement will be adequate to solve the variety of teaching and learning problems encountered in these institutions. To address these problems in an organized and direct way, the chancellors and presidents of several urban community college systems met in 1980 and proposed the creation of a Center for the Improvement of Teaching and Learning. This proposal was unanimously approved by those present at the meeting. They urged that steps be taken to create such a Center, to seek funds for the Center's initial years of operation, and to

propose ways in which the Center could best relate to community colleges throughout the country in order to have a major effect on the systematic improvement of both teaching and learning in these institutions.

The initial financial commitment to establish the Center was made by the City Colleges of Chicago. In spring of 1981, the administration of the City Colleges allocated resources for a three-year period to bring together a team of educational researchers, staff development experts, and new and experienced faculty in order to establish the proposed Center for the Improvement of Teaching and Learning.

The Purpose of the Center

The focus of work in the Center for the Improvement of Teaching and Learning is upon teaching and learning processes, methods, and variables. Special emphasis is being given to those aspects of teaching and learning that have the potential for a "multiplier effect" on student learning. Such a multiplier effect requires relatively small changes in teaching methods and procedures but yields large effects in student learning outcomes. These changes would cost very little in teacher time and effort but would significantly increase the proportion of students reaching particular learning standards, having positive motivation for further learning, and completing courses and college programs in a reasonable time.

The particular projects developed in the Center are

derived primarily from three sources: a) careful review of the educational literature on processes, methods, and variables which have been demonstrated to have large effects on teaching and learning; b) review of the ideas that have been used successfully by community college teachers in various parts of the country; and c) suggestions made by prominent scholars and researchers serving as consultants to the Center. Each idea and suggestion is considered in terms of its potential or actual effect on student learning and the likelihood that it can be made cost-effective.

Ideas on processes, methods, or variables for Center investigation are first tried on a carefully controlled pilot basis in at least one community college to determine their potential for improving teaching and learning. If an idea is found to be viable and promising on a pilot basis, the Center will then coordinate efforts to conduct a larger scale demonstration project that will involve a small number of community colleges (five or six) in different parts of the country. Records on a demonstration project will be kept locally to determine the conditions under which the idea works well or poorly and the extent to which it is effective for different types of students, for different kinds of objectives, and in different college subjects. If the results of such a demonstration project prove to be educationally and economically sound the Center will make the findings available through publications, workshops, and conferences to community college administrators and faculty

members who may wish to use the idea at their own college.

Center studies focus primarily upon the special problems of community college students in contrast to other students in higher education. It is generally agreed that many of these students lack prerequisite cognitive skills. In addition, most lack confidence in their ability to learn. However, when these students get evidence that they can achieve at a high level through mastery learning or other methods, their subsequent achievement, interest in learning, sense of self-worth, and motivation for further learning all appear to increase dramatically. Therefore, the Center will continue to work on strategies such as mastery learning, but will also search for other special conditions under which community college students can and do learn well.

Current Center projects cover a wide variety of topics, such as identification of the characteristics and behaviors of exceptionally effective community college teachers, the use of time in the classroom, the use of formal and informal student support systems to enhance learning, alternative ways of providing students with regular and prescriptive feedback on their learning progress, procedures for developing problem-solving skills and higher mental abilities, and special curriculum approaches--especially in the community colleges' strong areas of career and vocational/technical training. The Center is also investigating the types of inservice education and staff development activities that

are most effective for community college teachers.

In addition to the Center's research and staff development work, a number of other complementary goals are outlined. In particular, the Center hopes to provide new stimulus and enthusiasm for teachers in community colleges who are already committed to improving instruction, but who need fresh ideas and an atmosphere conducive to exploration in order to improve further their own teaching. New teachers who want to develop effective teaching methods and experienced teachers who want to improve their instructional skills are encouraged to become involved in Center projects. Through increased national visibility, the Center hopes to focus the thinking of all community colleges on the important issues of teaching and the special conditions under which community college students will learn well.

Future Directions for the Center

Center projects will be optimally effective only if community colleges from across the nation are involved in an active and cooperative way. In order to accomplish this, each cooperating institution in a nationwide Center consortium should have a small number of faculty members or administrators who are interested in particular problem areas, who will initiate pilot studies locally, amd who will participate in demonstration studies. These faculty members or administrators should also take responsibility for dissemination of the findings and their implications to faculty

colleagues at their institutions. The Center will augment this effort by sponsoring conferences, workshops, and other training programs for selected key faculty members; by coordinating the collection and analysis of information on the projects; and by preparing reports and publications on project results.

The need for such a coordinated effort at this stage in the development of community colleges cannot be overstated. As more new and highly diversified students enter the nation's community colleges, their teachers must have the skills and resources to meet their needs and educational expectations. Ways must be found to integrate the successful features of older modes of instruction with the best of the new. The Center for the Improvement of Teaching and Learning thus serves as a valuable and necessary resource for educators whose business is to educate the community and who need to know what works best in providing that education.

Current Studies in the Center

The staff of the Center for the Improvement of Teaching and Learning has been conducting a series of pilot studies on some promising methods of improving the learning of community college students. The five pilot studies described here all appear to have rather large multiplier effects; each requires only small changes and costs but should result in large returns for students, faculty, and the colleges.

Plans are being made to involve interested key administrators and faculty members at other community colleges in different parts of the country in large-scale demonstration studies of these methods. Initially four or five community colleges participating in a particular demonstration study would be adequate to determine the soundness of these methods and their applicability to other community college situations. Seminars and workshops are being planned by the Center staff to help these key administrators and faculty members to work out the strategies and procedures to use in the demonstration studies. In addition, these faculty members will also advise the Center staff on other pilot studies and approaches which have been successful in their colleges. These will then be considered for subsequent studies on a pilot and/or demonstration basis.

Improving First-Term Achievement

In a large number of studies conducted in colleges and secondary schools, it has been found that students' academic expectations and aspirations, as well as their rate of attrition, are in large measure determined by their first-term achievement. If students do well in first-term courses, it is likely that they will continue to do well in later courses and will complete the entire secondary school or college program.

In the Center for the Improvement of Teaching and Learning, a series of pilot studies is being conducted on the

effects of success or failure during the critical first term of enrollment. Specifically, means are being sought to increase the likelihood of student success in first-term courses. Some of the pilot studies in progress are described below:

1. Courses differ greatly in the levels of prior preparation required of students. Some courses, such as the first course in algebra, biology, a second language, history, or accounting, begin at a basic level and can be learned well with a minimum of specific subject prerequisites. Advanced courses in these subjects, however, require much more in terms of prerequisites and prior knowledge. In addition, first courses in subjects such as geometry, English composition, and literature are highly dependent on successful prior learning in related subjects. The hypothesis of this study is that if first-term students are advised and encouraged to enroll in courses with fewer or minimum prerequisites as well as in courses in which they have great interest or motivation, they will earn grades that are average or better.

The records of about one thousand first-term students are being studied to determine the effects on their achievement and persistence of taking first-term course programs with minimal versus maximal prerequisites. If the results of this investigation support the hypothesis, criteria will be devised for faculty to use in advising first-term students during registration. These criteria would include such

things as the listing of courses in terms of the specific skills students are expected to have upon entry. Plans have also been made to do follow-up studies on the effectiveness of the use of these criteria in reducing rates of student attrition, enhancing the learning and self-esteem of students, and increasing their persistence in taking more advanced courses.

2. Another related pilot study involves those teachers who are unusually effective in bringing the majority (85-90 percent) of their students to completion of the course with excellent learning by the students. The reasons for success of first-term students in courses taught by such teachers are being studied, together with the effects of taking one or two courses with such teachers on student achievement, sense of self-worth, and attrition.

3. Mastery learning approaches to teaching have been very effective for the majority of community college teachers using these methods and typically result in a large proportion of students completing courses with relatively high levels of achievement (A's and B's). This study focuses on the effects of mastery learning methods on the achievement, self-esteem, and persistence of first-term students taking one or two courses taught by mastery methods.

Although it is too early to be certain, preliminary Center research shows that some combination of carefully advising students as to first-term courses, placement in courses taught by very effective teachers, and courses using the

mastery approach has a marked influence on student achievement, self-concept, and persistence in the first-term as well as subsequent courses in the community college. It should be noted that the costs of such advising and placement are very low, while the benefits to students, faculty, and the college are likely to be very great. These are illustrative of what have been referred to as "multiplier effects."

Effective Teaching

As noted earlier, students enrolling in community colleges, when contrasted with students in four-year colleges, are generally lower in scholastic aptitude and previous school achievement, are less confident in their ability to learn, tend to be older, and frequently carry part or full-time work and family responsibilities. These students form a distinct clientele that differs from that found in other institutions of higher education. A major problem is to find ways in which these students can learn effectively and aspire to a college education in spite of their earlier academic history.

In the City Colleges of Chicago, it has been found that roughly ten percent of the teachers are remarkably effective with these students and manage to get a large proportion of students to high levels of achievement with almost 90 percent of the students completing the course. This is in contrast to the average City Colleges teacher who gets about 60 percent of the students to complete the course with rela-

tively few of those at high levels of achievement.

A sample of those very effective teachers is presently being interviewed to try to understand the methods and procedures they use in their teaching that may account for their unusual results with students. From early interviews with these teachers, it has been found that: a) they all believe that their subject is very important for students to be learning; b) they are sure that almost all of their students can learn the subject to a high level, especially if they are teaching it; and c) they have a very positive regard for students. It is believed that most of the more detailed findings from these interviews will reflect methods of teaching rather than the personality characteristics of the particular teachers. If these pilot study results are borne out by further demonstration studies, descriptive articles will be prepared on these methods and procedures. Furthermore, a variety of development activities will be tried to help other teachers interested in improving their teaching to make use of these sound practices.

Mastery Learning and Alternative Strategies

Mastery learning approaches to teaching have been used by a large number of community college teachers in a wide variety of courses. As indicated before, studies on the application of mastery learning have shown these instructional techniques to be very useful in enhancing achievement and reducing attrition among community college students.

In a series of pilot studies on mastery learning, the flexibility of these procedures is being explored, together with the use of particular learning techniques that may accomplish similar results. Specifically, these studies are investigating: a) teachers' use of their own quizzes to provide students with feedback on their learning progress; b) various ways of involving students in corrective activities, including having students work in small study teams, more frequent review sessions for students, and the use of self-instructional modules; c) more efficient and less costly ways of having students do corrective work outside of class time; and d) alternative informal support systems and strategies for teachers to use in incorporating these systems in their courses.

Higher Mental Processes

In a majority of community college courses, the focus of most student learning is on the recall of information or the translation of information from one form to another. These skills are generally referred to as lower mental processes. In contrast to such lower level skills, learning can involve the interpretation of information or its application in new or different situations. It may also involve the analysis or synthesis of information, or evaluation of its appropriateness. Skills such as these are referred to as higher mental processes.

Generally, lower mental processes are easy to teach and

easy to test. The one-way communication of a lecture is ideally suited to provide information to be recalled at a later time. Research also indicates that usually 95 percent or more of a teacher's questions on tests are based on the recall of information. Although this type of learning is very useful in stable or restricted situations, recall is usually very brief and almost 50 percent of the learned information is lost within a few months.

Higher mental processes, on the other hand, are generally very difficult to teach. They usually require teachers to use dialectic-discussion methods that involve problematic situations. While higher mental processes can be tested, in most cases effective testing requires some special training. When higher mental process items are included on teacher-made quizzes, however, and when students are given practice and help in responding to these items, their learning and retention of information can be greatly improved.

Studies are being planned to help teachers include higher mental process items and tasks on their regular course quizzes and tests. The hypothesis in these studies is that when students are given practice in higher mental processes through these quizzes and tests, they will enjoy learning more and will better retain these higher-level skills and abilities. One of the approaches being developed is the use of higher mental process items on the formative tests of mastery learning teachers. The assumption here is that if teachers include higher mental process problems and

questions as a part of their feedback and corrective procedures, a large proportion of students will develop higher mental process abilities. When this is done, students are also likely to find learning more interesting, more challenging, and more rewarding. However, developing ways of addressing higher mental processes in teaching and learning activities for community college students is a longer-term project than some of the Center's other endeavors, and it is likely to require continuing and expanded effort.

Conclusion

The procedures, methods, and variables in these studies are believed to be some of the most important in regard to teaching and learning in the nation's community colleges Although each study is designed in hopes of dramatically improving students' learning success, none requires major changes in the structure or format of a community college. Hence, the results of these studies should be applicable to a variety of community college settings.

THE CENTER FOR THE IMPROVEMENT OF TEACHING AND LEARNING

The Center of the Improvement of Teaching and Learning is a major research and staff development unit located jointly at Chicago City-Wide College and at the Central Administrative Offices of the City Colleges of Chicago. In addition, the Center is to be the focal point for a consortial effort in educational research by 16 large urban community college districts in the United States. The variety of services provided by the Center include the following:

Research: design and implementation of pilot and demonstration studies in all areas related to teaching and learning in the community college; assistance in program and project evaluation; assistance to faculty and administration in the areas of tests and measurements.

Professional Development: professional inservice program for faculty leading to lane promotion credit; management training program through the American Council on Education's Higher Education Management Institute; workshops and seminars for all levels of the City Colleges of Chicago staff.

Information and Resources: professional staff research library; curriculum development grants; media services for faculty and staff; system-wide newsletters and occasional papers.

Mastery Learning: specific curriculum development and inservice training for faculty using mastery learning teaching strategies; national conference and workshops for beginners and practitioners in the mastery learning method.

Computer-Assisted Instruction: system-wide management of PLATO (Programmed Logic for Automated Teaching Operations)—the City Colleges' "computer tutor"; curriculum development and inservice for faculty involved in computer-assisted instruction.

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