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ABSTRACT

In this working paper on needed research issues, areas of inquiry are grouped in a way that parallels the programs of the National Center for Research in Postsecondary Teaching and Learning (NCRIPTAL); additional categories are also cited. The following topics are addressed: (1) issues of student learning (participation and involvement, intellectual development, attributes and learning styles, and assessing outcomes); (2) curricular issues (models and designs, general education versus specialization; liberal education versus vocational study; and teaching and learning across the curriculum); (3) studies of teaching and of the faculty (faculty career preparation and development, selection and assessment, knowledge and expertise); (4) the organizational context for teaching and learning (leadership, effectiveness, structures and management practices, institutional linkages, and external influences); (5) the technological information environment (general impact, impact on learning, and impact on access to information and literacy); and (6) general research issues (research frameworks; definitions, measures, and analysis of student characteristics and outcomes; and longitudinal studies and databases). Each topic section includes selected references for institutional leaders, and for researchers. (LB)

Postsecondary Teaching and Learning Issues in Search of Researchers

A Working Paper

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Postsecondary Teaching and Learning Issues in Search of Researchers

A Working Paper

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introduction

The National Center for Research to Improve Postsecondary Teaching and Learning (NCRIPTAL) was funded in 1986 by the U.S. Office of Educational Research and Improvement, Department of Education. NCRIPTAL is focusing its research, development, and dissemination activities on five aspects of college environments that affect learner outcomes: (1) class-room learning and teaching strategies, (2) curricular structure and integration, (3) faculty attitudes and teaching behaviors, (4) organizational practices, and (5) use of emerging information technology.

In addition to its own research efforts, NCRIPTAL provides national leadership for other researchers concerned with the improvement of postsecondary teaching and learning. This leadership role includes:

1. Encouraging discussion about needed research that extends beyond NCRIPTAL's immediate scope and budget;

2. Promoting the interchange of ideas among researchers; and,

3. Providing technical advice to institutions undertaking self-improvement efforts.

NCRIPTAL is meeting the first two goals of encouraging discussion and promoting idea interchange by offering this working paper on needed research issues.

In developing a manageable research agenda for NCRIPTAL's efforts over the five-year grant period, it was necessary to bypass many of these critical research questions. Some are closely related to the investigations that NCRIPTAL will pursue; others are conceptually quite distant. Because we hope that other researchers will investigate both types of questions, we have begun this outline of the broad dimensions of many important issues needing further development.

For ease of discussion, we have arbitrarily grouped the questions in a manner parallel to the educational process dimensions or environments around which NCRIPTAL programs are organized (see Figure 1). We have created additional categories for those questions not closely related to our current work.

As the dotted lines in Figure 1 indicate, the five categories of potentially alterable variables that provide an organizing framework for the NCRIPTAL programs are not distinct but rather overlap and are intertwined in complex ways. Although our research foci represent different institutional levels of investigation (the college, the academic program, the classroom) and different units of analysis (the college climate, the faculty, the curriculum, and the student), changing one of these important elements of the postsecondary environment undoubtedly will stimulate changes in others. Similarly, it is unreasonable to suggest that college teaching and learning can be enhanced by changes only in a single area. Improvement in teaching and learning requires a stronger base of knowledge in all of these areas, as well as in others.

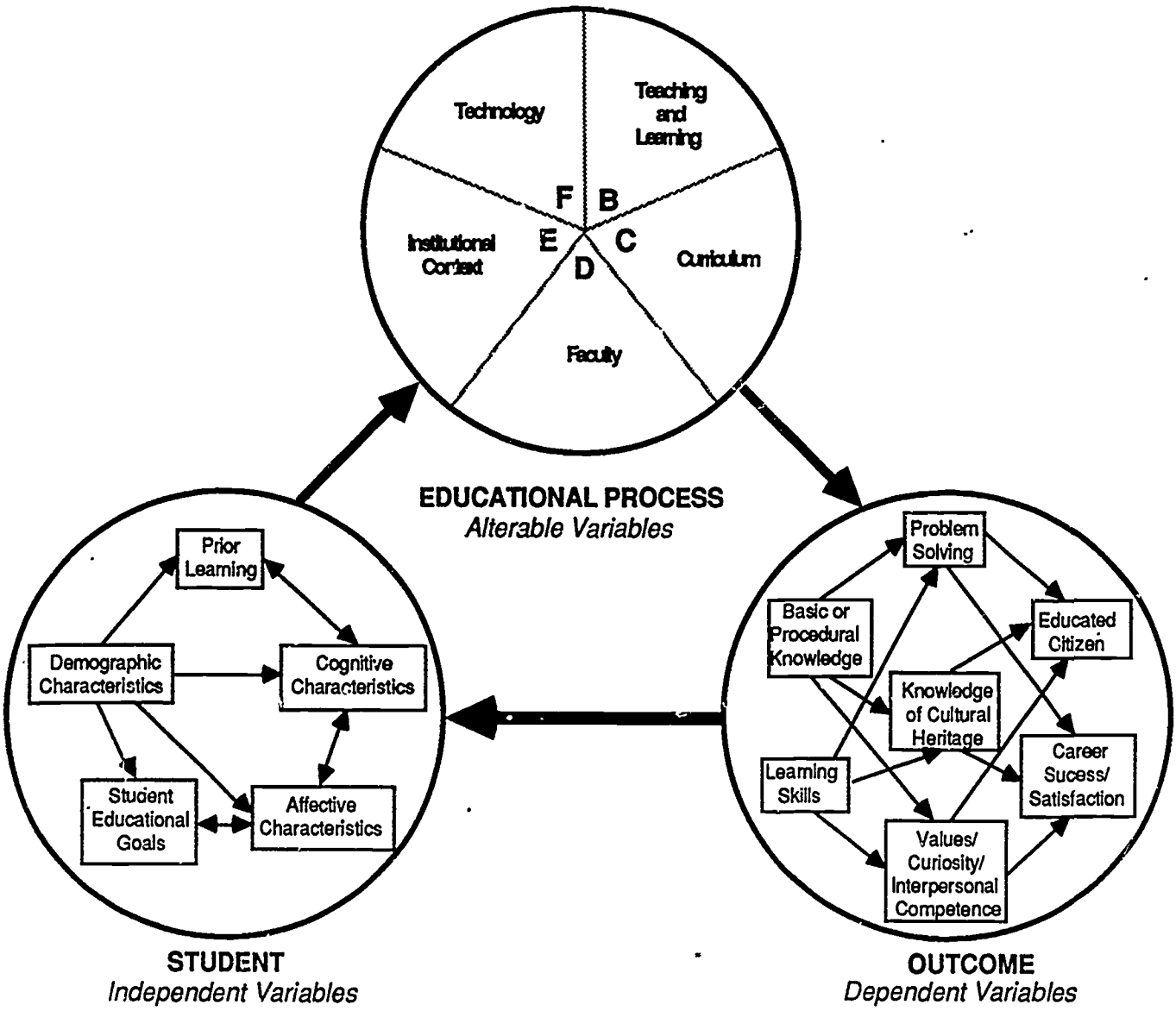

Figure 1. Variables in NCRIPTAL's Research Agenda

I. Issues of Student Learning

The NCRIPTAL program entitled Instructional Processes and Educational Outcomes is exploring how student cognitive and affective characteristics, such as learning strategies, motivation, personality, learning styles, and stages of intellectual development: (1) affect student learning outcomes, (2) are themselves learning outcomes that may be altered to improve learning, and (3) are related to student demographic variables, such as ethnicity, age, and sex, so as to suggest different teaching and learning strategies for various groups of students. The program's work proceeds from three perspectives: cognitive theory, personality theory, and developmental theory.

Related Issues and Research Questions

1. Student Participation and Involvement

The title of the recent national report, *Involvement in Learning* (NIE Study Group, 1984) has caught the attention of the postsecondary community. Both intuitively and empirically, it is easy to accept the idea that students will learn more if they are involved in their education and devote effort to the educational task. The once predominant image of students learning by passively receiving "facts" and assimilating them through rote learning or conditioning has given way to an emphasis on active learning. Students are now seen as achieving understanding only through their purposive structuring of knowledge. There is need, however, for a fuller definition of "involvement" and for additional consideration of ways in which involvement can be fostered. The key question to be asked is:

How can we help postsecondary students to become more effectively involved in their education?

Some of the subsidiary questions that might be asked include:

What practices can colleges change, within and outside the classroom, that affect student involvement? Once identified, how can hindrances be reduced and facilitators be enhanced?

How can we help students learn in less than optimal learning situations that may exist because of their particular backgrounds or because of limited institutional resources?

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2. Student Intellectual Development and Capacities for Critical Thought

"Higher order thinking skills" and particularly the ability to think critically and to analyze material are generally accepted goals of higher education. Yet insufficient research has been devoted to the definition and documentation of student growth in these areas. There are many approaches possible in this accelerating area of research.

From a developmental perspective, students may selectively attend to certain features of a learning situation depending on their life stages and levels of maturation. Successful task completion may depend on "readiness" for certain concepts.

Cognitive theorists believe that students progressively restructure knowledge as they learn rather than simply add to their store of facts; understanding is enhanced as the student develops more complex schema for organizing information. For this reason interest has increased in investigating "critical thinking" and in developing methods to teach problem solving.

Finally, from a personality perspective, there appear to be strong interactions between the way students perceive their own abilities and their success in learning.

Some questions include:

What can we learn about helping students to "frame problems?"

How do students process and understand lectures and discussions? What can be learned from "on-line" measures of student's thoughts during classroom events?

What do students learn from writing papers in particular fields? What can be learned from a "task analysis" of writing and its attendant cognitive process?

What does evidence that student learning varies with intellectual maturity or other developmental stages tell us about the time periods when certain subjects are most effectively taught and learned?

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3. Student Attributes and Learning Styles

Some researchers believe that individuals develop dominant cognitive styles based on personal characteristics and life experiences. After entering college students are likely to specialize in disciplines whose inquiry norms match their learning styles. Perhaps through this self-selection and subsequent socialization process, these learning styles may be accentuated. In some fields, student peer groups may be another important source of learning the dominant cognitive styles. Learnings from both academic programs and peer groups may either reinforce or oppose the formal institutional goals.

What are the relationships between student learning styles, departmental and peer group, norms, and learning goals established by the college?

In what ways do students learn from their peers? Can peer learning be enhanced or modified?

In what ways can colleges use knowledge about learning styles to enhance the learning environment within specific programs?

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4. Assessing Student Outcomes

Assessment is the "topic of the day" in postsecondary education and the term has taken on several meanings. Perhaps the most critical questions concern how assessment can help improve teaching and learning. Among the unanswered questions are:

How can assessment of student learning be used as a tool for improving teaching and learning?

In what forms is feedback from assessment best presented to students?

What changes in teaching and learning are taking place in institutions where various kinds of assessment strategies are being introduced?

What kinds of student outcomes require multiple assessments over time?

Can assessment help us identify and prevent "incidental" learning in college that might be considered counterproductive to desired outcomes? For example, memorizing for tests, becoming a dependent thinker, learning to dislike reading?

Does assessment itself have any negative side-effects on teaching and learning? In what circumstances?

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II. Curricular Issues

National reports (NIE Study Group, 1984; AAC, 1985; Bennett, 1984) have brought the postsecondary curriculum into sharp focus. Unfortunately, there is not always agreement on the meaning of the term curriculum nor has there been a history of systematic approaches to curricular change. Curriculum issues are issues of both product and process: what students should learn and how it should be arranged for most effective learning. Proponents of various strategies for improvement seem to agree, however, that the plan of study should be meaningfully integrated and that what is expected of students should be clear.

Defining of curriculum as an academic plan, the NCRIPTAL Program on Curricular Integration and Student Goals is studying (1) the ways in which faculty members organize academic content and (2) how the way content is organized interacts with student and program goals to affect student learning outcomes. Because curriculum issues are so diverse—varying with institutional and program goals, disciplinary focus, and faculty beliefs about education—many questions remain unanswered.

Related Issues and Research Questions

1. Curricular Models and Designs

Should every academic program have a clear "vision" or philosophy of education as a basis for curricular planning? What are the differences in student outcomes for programs with consensus about such a vision and those where faculty views are diverse?

Do student outcomes in programs that explicitly state their expectations for students differ from outcomes in those that do not?

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2. General Education Versus Specialization

Many critics believe that students are concentrating on specialized courses to the neglect of broader studies. In *Involvement in Learning,* the NIE Study Group (1984) has suggested the equivalent of two years of general education for all students. In *Integrity in the College Curriculum,* the Association of American Colleges (1985) indicated that study "in-depth" should be informed by breadth and accuses faculty members of abdicating their responsibility for liberal education. In Bennett's, "To Reclaim a Legacy" (1984), the author expresses the view that considerably more stress should be placed upon the study of humanities that represent mankind's greatest accomplishments.

Among the research questions that are unanswered:

Is there evidence that general education promotes an increased sense of social responsibility and effective citizenship among students?

At what stages in students' intellectual development are general education courses most relevant?

In what ways can linkages between general or liberal education in college with students' academic preparation in secondary school be improved?

One analyst (Adelman, 1985) has suggested a relationship between the decline in GRE scores 1964-72 and increased student specialization. Can this suggested causal relationship be confirmed? If so, what are the implications for curriculum planning?

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3. Liberal Education Versus Vocational Study

Debate about the purposes of collegiate education, specifically about the balance of liberal education versus career preparation, has a long history. According to reports on the interests of college freshmen, current students show extremely strong interest in preparing for careers. Despite the abundant arguments on both sides of this issue, there is little research evidence to indicate that students in career-oriented programs achieve less in outcomes typically thought of as the goals of liberal education.

Some research questions include:

In many undergraduate professional fields, five- or six-year curricula are being introduced to accommodate a renewed emphasis on liberal education as well as advancing technical/professional knowledge. Is there evidence that either liberal or professional learning is enhanced over those programs that retain the traditional four-year curriculum?

What have been the effects on student learning of (a) more fully integrating liberal education ideas into undergraduate professional curricula, and (b) introducing some ideas from professional fields (i.e., law and engineering) as components of a liberal education for improved citizenship or critical thinking?

What is known about effective ways to bridge the gap from college to the working world? Are there learnings from cooperative work programs that could be used to enhance liberal education?

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4. Teaching and Learning Across the Curriculum

Comparative studies across the diverse curricula now found in American colleges are noticeably lacking. Yet various academic disciplines and career-directed fields of study may have much to learn from each other.

These research questions seem important:

How can academic programs be assisted in developing effective studies of curricular change?

What are the effects upon learning of studying diverse subjects concurrently versus intense study of different disciplines at different times in the educational program?

What lessons of student motivation and active learning can be learned and adopted learned from cooperative education and from clinical education in the professions?

How can students in all fields gain more experience in speaking skills as well as writing skills?

What are the effects on achievement, motivation, and cognitive growth of programs that involve undergraduate students in research activities?

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West, L. H. T., & Pines, A. L. (1985). *Cognitive structure and conceptual change.* New York: Academic Press.

III. Studies of Teaching and of the Faculty

In recent years a number of large-scale studies have documented background, concerns, and attitudes of the college faculty (Bowen & Schuster, 1986; Finkelstein, 1984; Ladd & Lipset, 1975). These surveys and interviews have identified both problems and satisfactions in faculty life but have not directly related these findings to faculty members' teaching roles.

The Program on Faculty as a Key Resource is improving understanding of how faculty characteristics and behaviors: (1) depend on faculty incentives, role integration, and the institution's academic climate; (2) interact with student characteristics to produce varied student learning outcomes; and (3) can be assessed and altered to improve learning in ways that more effectively produce the desired learning outcomes.

Related Issues and Research Questions

1. Faculty Career Preparation and Development

In a cautious phrasing, the NIE report (1984) supported specific preparation of college faculty for the teaching role. Similarly, the AAC report (1985) implied that faculty members need to become more interested in the total education of students and to take seriously their role as educators as well as their role as disciplinary specialists. Little research has been done to determine just what factors in a faculty career or training will improve student learning.

Some unanswered questions include:

Given knowledge about trends in student populations, institutional resources and related research on teaching and learning, what would be appropriate ideal preparation for the professor of the future?

What is known about how faculty members keep current in their specific fields of knowledge and how their continued currency can be enhanced?

What is known about how faculty members come to value their role as teachers and how this role can be enhanced?

What new initiatives in enhancing the role of faculty as advisors appear fruitful?

What techniques can faculty use to sense and enhance student motivation?

In different institutional settings, what prior successes and failures of instructional development programs can be documented and used for continued improvement?

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2. Faculty Selection and Assessment

A recent lack of job opportunities for college professors, particularly in such fields as the humanities, has caused many promising individuals to enter nonfaculty careers. Some observers fear that both the number and quality of those entering the faculty ranks bodes ill for the future of higher education.

For those who are college teachers, a rather extensive enterprise of student evaluation of faculty has developed in most institutions. There has been little documentation of how the results of student evaluation have been used to foster improved teaching.

How can student ratings or responses to instruction be used to improve faculty effectiveness, particularly in areas of high concern such as teaching and learning problem-solving skills?

Where and how are multiple evaluations of teaching (including peer evaluation) being used and with what effect?

What have been the responses to and the effects of the NIE Study Group recommendation that senior faculty be assigned to teach lower division undergraduate courses?

What motivators cause promising individuals to enter college teaching and how can these be promoted?

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3. Using and Sharing Faculty Knowledge and Expertise

Consultation by faculty has been considered valuable by government ("the brain trust") and industry. In some universities, new mechanisms are being developed to facilitate "technology transfer" between universities and private enterprise. Yet, others criticize faculty consulting activities as violating standards of efficiency and accountability and, what is worse, detracting from their role as teachers.

What is the transfer of knowledge from faculty consulting activities to the classroom?

Can and should teaching be turned from a private into a cooperative enterprise?

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IV. The Organizational Context for Teaching and Learning

In the corporate world, considerable attention has been focused on the concept of organizational culture and the conditions that foster "effective organizations." Similarly, in K-12 educational settings, the "effective schools" research has identified organizational conditions that appear to contribute to student learning. In higher education, it has long been thought that some colleges have more effective educational programs than others, but it is not easy to separate the specific conditions that support academic effectiveness from other variables, such as the characteristics of the student body that the college attracts.

The Program on the Organizational Context of Teaching and Learning is attempting to identify organizational practices within colleges that produce a supportive academic climate for teaching and learning to suggest how such a climate can be fostered. External conditions are also important and, in cooperation with the National Center on Postsecondary Governance and Finance, this program will undertake studies of supportive external factors such as state policies.

Related Issues and Research Questions

1. Organizational Leadership

In higher education there has been a reluctance to view administrators as managers of their institutions. Only a modest amount of literature exists on assessing managerial performance in domains logically related to student learning outcomes. Presidential roles have been studied most extensively but, except for studies of demographic characteristics and career patterns (Moore, 1983), studies of academic administrators' direct involvement in the teaching and learning program are scarce.

In what ways and to what degree is academic leadership (including turnover of top-level executives and department chairpersons) related to a healthy learning climate, to faculty excitement, and to dedication to the teaching role?

In what different ways do department chairpersons accept leadership in matters of teaching and learning? How can such leadership be encouraged?

How can administrative processes be streamlined to allow academic leaders to focus greater effort on instructional leadership?

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2. Organizational Effectiveness

Recent studies from the business world have emphasized organizational effectiveness and have particularly stressed the establishment and acceptance of norms of excellence among all employees. Successful enterprises are viewed as those that are constantly assessing the impact of their environment, creating solutions to current

and anticipated problems, and showing a high concern for organizational and employee learning.

What is the relationship between organizational learning and student learning in higher education?

Since colleges can be deemed effective in several different activity domains (e.g., research, teaching, service, fund-raising), what is the relationship between effective teaching and learning and other important dimensions of institutional effectiveness?

What are the particular traditions and practices in institutions that enhance a culture of excellence?

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3. Special Organizational Structures and Management Practices

Within colleges and universities, experiments have been conducted with many types of organizations believed to facilitate learning. Such special organizational arrangements include, for example, residential colleges, cooperative work-study programs, consortium arrangements, and study-abroad programs. Many of the reports of such experiments have been case studies that do not clearly document whether or how various aspects of student learning change as a result of the program. Currently, it is popular to talk about "active learning" and "learning communities"; many organizational patterns, including some of those mentioned above, appear to result in more active learning.

To what extent are strategies related to the creation of special "learning communities" sufficiently successful to have broader use in higher education?

How do understandings from special organizational arrangements for learning become institutionalized in the broader educational program?

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4. Institutional Linkages and Relationships

Much criticism has been directed at the American high school (see A Nation At Risk, 1983) and at declining aptitude and achievement test scores of students preparing to enter college. Some colleges and universities have tightened admissions requirements, in part to encourage high schools to supervise student preparation more rigorously. These actions have, in turn, produced concern about equal college access for students in traditionally disadvantaged groups. At the same time, the NIE study group (1984) has recommended strengthening the lower division college program in the area of general education. The College Board (1983) has published a compendium of knowledge and skills students should have to be well prepared for college. Yet there is little basis to judge whether there are sufficiently strong linkages between colleges and high schools to facilitate the efficient and effective organization of student learning experiences.

What are the possibilities that colleges and high schools can work together to strengthen capabilities of entering students to ensure general education and yet avoid prolonging the college period?

In what ways can American colleges and universities link with educational programs being developed by corporations?

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5. External Influences

Nearly every state in the United States is reviewing college and university programs and attempting to find new ways to improve effectiveness and efficiency. The National Governors' Association has devoted considerable discussion to this issue. Some researchers have found that such external impetus is necessary to promote academic change (Hefferlin, 1969). Yet, organizational theorists might claim that internally generated change engenders more commitment in colleges than does change imposed from outside.

What knowledge can be gained from comparing improvements in teaching and learning in states that have recently imposed curriculum changes or requirements (including testing requirements) and those states that have called upon colleges to undertake this task themselves?

What are the implications for teaching and learning of such proposals as tying student financial aid allocations to quality initiatives of institutions?

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V. The Technological Information Environment

Evolving technologies affect the way we live and work. It is likely that the shift to an information-based technology will dramatically change teaching and learning within institutions and universities, and even change the colleges themselves. Indeed, the accessibility of small computers may change the way students think.

The Program on Learning, Teaching, and Technology is attempting to increase understanding of the current and potential uses of technology in college instruction, the learning situations in which technology is most appropriately , and the conditions that facilitate its effective and appropriate use. A national dialogue on "information literacy" will be initiated among college faculty members who will consider the implications that emerging information technologies have for their programs. After developing a taxonomy to describe and evaluate software, the program will sponsor conferences at which faculty members and software producers can work toward production of most effective learning materials.

Related Issues and Research Questions

1. The General Impact of Electronic Technology on Higher Education Management and Teaching Practices

Management in many institutions is now occupied with making efficient and effective computing systems available to perform a wide variety of tasks throughout colleges and universities.

Will those institutions that can afford hardware to computerize the entire administrative operation realize benefits sufficient to justify the expense?

Will institutions that insist on system compatibility across departments realize a revolution in inter-disciplinary dialogue?

Will the use of certain technologies make professors reevaluate where they concentrate their time? For example, will the use of database files encourage the professor to shift the use of primary instruction time from data production and collection to data evaluation?

To what extent has technology already fostered more efficient and effective management of colleges and universities?

What computer technology is available to aid faculty in their administrative and teaching tasks (tools such as authoring systems, test generators, grade books, etc.), and how does the use of such tools change the teaching role?

To what extent has technology changed faculty teaching styles? Is this effect different for different disciplines?

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2. The Impact of Electronic Technology on Learning

Experiences with radio in the Open University in Britain and with broadcast television here in the United States suggest that no single technology, however advanced, can claim a monopoly on producing effective learning. It seems that the medium in which the technology is manifested—be it audio, video, or electronic text and graphics—may have a stronger relationship to producing intended learning than any technologically determined variable.

For example, audio is a medium well-suited for the instruction of music and languages. Employing the technologies of tape cassettes and earphones instead of live conversations or concerts however, may result only in savings of efficiency and cost (due to replay capacities) rather than improvements in some qualitatively different, more effective learning.

Studies on use of television have split over whether any special learning benefits can be associated with that technology per se. Yet, even as the use of television is being studied, claims for the special benefits of instruction by computer text and graphics are being made.

What impact has educational broadcast television had on access to and quality of learning in higher education?

What is the impact of electronic communication systems on knowledge transfer?

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3. The Impact of Electronic Technology on Access to Information and Development of Literacy

The benefits of using electronic technology over more traditional teacher-oriented instruction can be judged in a variety of ways. These include not only examining increased capabilities of learners and increased efficiency and reduced costs to institutions, but also attitudes of learners and increased attractiveness of the learning process. Any combination of reduced costs of instruction, increased capacity to provide instruction per hour of time, and increased learner interest could result in more people pursuing education and a resulting higher literacy rate.

What changes are electronic technologies bringing to college teaching materials, including textbooks and coordinated learning packages?

What are the effects of new types of graphic presentations on learning various types of subject matter?

What role will college libraries play in the new electronic information society? In what ways can they make a stronger impact on student learning strategies?

VI. General Research Issues

In the last forty years research on various aspects of higher education has increased rapidly. Additionally, increasing sophistication of researchers and availability of computer programs that process large databases have made possible broad-scale studies of both entering students and graduates. The findings on college learning and teaching, however, are fragmented and in need of synthesis. As institutions and public agencies move toward coordinated programs of research to document outcomes and as colleges use assessment information to improve teaching, a number of issues arise concerning the form such research should take, the locus of responsibility for conducting it, and the manner in which it can be best used.

1. Appropriate Research Frameworks

What frameworks may fruitfully guide comprehensive programs of research on college learning and teaching?

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What research are institutions currently conducting to improve teaching and learning? What appear to be efficient and effective methods to gather data that will actually be useful to faculty and administrators?

What represents a comprehensive program that would exemplify the model of what colleges of various types should be doing in the way of institutional research on the teaching/learning environment?

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2. Definitions, Measures and Analysis of Student Characteristics and Student Outcomes

Can researchers reach consensus on standard definitions and measures that would provide comparability across studies and across institutions?

What is the "state of the art" in making defining and measuring important but elusive outcomes such as (a) value development, (b) social responsibility, (c) reflective thinking, (d) self-assessment? What developmental efforts are needed in these areas?

What is the level of literacy, numeracy, and technology literacy that should characterize a college entrant? A college graduate?

In light of today's available measures, what constitutes a comprehensive battery of measures that will prove useful in placing entering college students in appropriate educational experiences?

What statistical procedures will assist in making meaningful and legitimate comparisons of student achievement among institutions? Can these procedures be prepared in a simple form for institutional use?

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3. Longitudinal Studies and Data Bases

As various proficiency exams are introduced to meet assessment and accountability initiatives, what types of validation studies, institutional record keeping or other research should individual colleges be introducing to make best use of this data?

Is there need for a national longitudinal database on students (and on faculty) that contains different information from those now available? If so, what elements should such databases contain and how could they be used to improve teaching and learning?

What longitudinal studies of student development from high school into and through college should be initiated? Whose responsibility is it to develop plans for such studies?

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