

DOCUMENT RESUME

ED 287 441

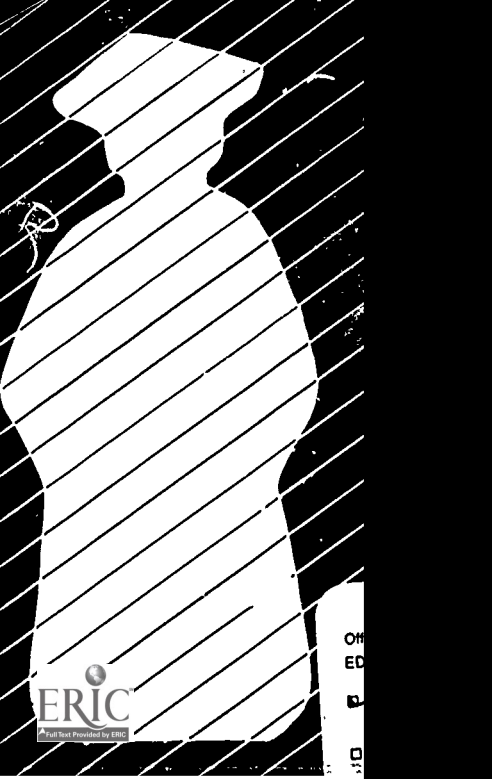
HE 020 915

AUTHOR Vogel, Carol D.; Stark, Joan S.
TITLE Postsecondary Teaching and Learning Issues in Search of Researchers. A Working Paper.
INSTITUTION National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 86
GRANT OERI-86-0010
NOTE 26p.; From the NCRIPAL Program on Research Leadership, Design and Integration.
AVAILABLE FROM NCRIPAL, Suite 2400 School of Education Building, The University of Michigan, Ann Arbor, MI 48109-2748 (Technical Report No. 86-A-001.0, \$5.00).
PUB TYPE Reports - Research/Technical (143)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *College Curriculum; *College Faculty; *College Instruction; *College Students; Curriculum Development; *Educational Research; Educational Technology; Higher Education; Organizational Climate; Outcomes of Education; *Research Needs

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 (NCRIPAL); 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)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *



OFF
ED
P
10

Postsecondary
Teaching and
Learning Issues in
Search of
Researchers

A Working Paper

**Papers in this series
available from NCRIPAL**

**Approaches to Research on the Improvement of
Postsecondary Teaching and Learning:
A Working Paper**

Patricia J. Green and Joan S. Stark

**Focusing on Student Academic Outcomes:
A Working Paper**

Joanne M. Alexander and Joan S. Stark

**Teaching and Learning in the College
Classroom: A Review of the Research Literature**

*Wilbert J. McKeachie, Paul R. Pintrich,
Yi-Guang Lin, and David A. F. Smith*

**Psychological Models of the Impact of College
on Students**

Harold A. Korn

**Designing the Learning Plan:
A Review of Research and Theory Related to
College Curricula**

*Joan S. Stark and Malcolm A. Lowther, with
assistance from Sally Smith*

**Faculty as a Key Resource:
A Review of the Research Literature**

*Robert T. Blackburn, Janet H. Lawrence,
Steven Ross, Virginia Polk Okoloko,
Jeffery P. Bieber, Rosalie Meilard, and
Terry Street*

**The Organizational Context for Teaching and
Learning: A Review of the Research Literature**

*Marvin W. Peterson, Kim S. Cameron,
Lisa A. Mets, Philip Jones, and
Deborah Ettington*

**Electronic Information:
Literacy Skills for a Computer Age**

Jerome Johnston

**Design in Context: A Conceptual Framework
for the Study of Computer Software in
Higher Education**

Robert Kozma and Robert Bangert-Drowns

Postsecondary Teaching and Learning Issues in Search of Researchers

A Working Paper

by
Carol D. Vogel
and
Joan S. Stark

Grant Number OERI-86-0010

Joan S. Stark, Director
Wilbert J. McKeachie, Associate Director

Suite 2400 School of Education Building
The University of Michigan
Ann Arbor, Michigan 48109-1259

(313) 936-2748

© 1986 by the Regents of The University of Michigan

The project presented, or reported herein, was performed pursuant to a grant from the Office of Educational Research and Improvement/Department of Education (OERI/ED). However, the opinions expressed herein do not necessarily reflect the position or policy of the OERI/ED and no official endorsement by the OERI/ED should be inferred.

Contents

Introduction	1
<hr/>	
i. Issues of Student Learning	3
Student Participation and Involvement	3
Student Intellectual Development and Capacities for Critical Thought	3
Student Attributes and Learning Styles	4
Assessing Student Outcomes	5
<hr/>	
ii. Curricular Issues	7
Curricular Models and Designs	7
General Education Versus Specialization	7
Liberal Education Versus Vocational Study	8
Teaching and Learning Across the Curriculum	9
<hr/>	
iii. Studies of Teaching and of the Faculty	11
Faculty Career Preparation and Development	11
Faculty Selection and Assessment	11
Using and Sharing Faculty Knowledge and Expertise	12
<hr/>	
IV. The Organizational Context for Teaching and Learning	13
Organizational Leadership	13
Organizational Effectiveness	13
Special Organizational Structures and Management Practices	14
Institutional Linkages and Relationships	14
External Influences	15
<hr/>	
V. The Technological Information Environment	17
The General Impact of Electronic Technology on Higher Education Management and Teaching Practices	17
The Impact of Electronic Technology on Learning	17
The Impact of Electronic Technology on Access to Information and Development of Literacy	18
<hr/>	
VI. General Research Issues	19
Appropriate Research Frameworks	19
Definitions, Measures, and Analysis of Student Characteristics and Student Outcomes	20
Longitudinal Studies and Data Bases	20
<hr/>	
General References Cited in Text	21
<hr/>	
Figures	
1. Variables in NCRIP TAL's Research Agenda	2

introduction

The National Center for Research to Improve Postsecondary Teaching and Learning (NCRIP TAL) was funded in 1986 by the U.S. Office of Educational Research and Improvement, Department of Education. NCRIP TAL 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, NCRIP TAL 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 NCRIP TAL's immediate scope and budget;
2. Promoting the interchange of ideas among researchers; and,

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

NCRIP TAL 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 NCRIP TAL'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 NCRIP TAL 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 NCRIP TAL 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 NCRIPAL 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.

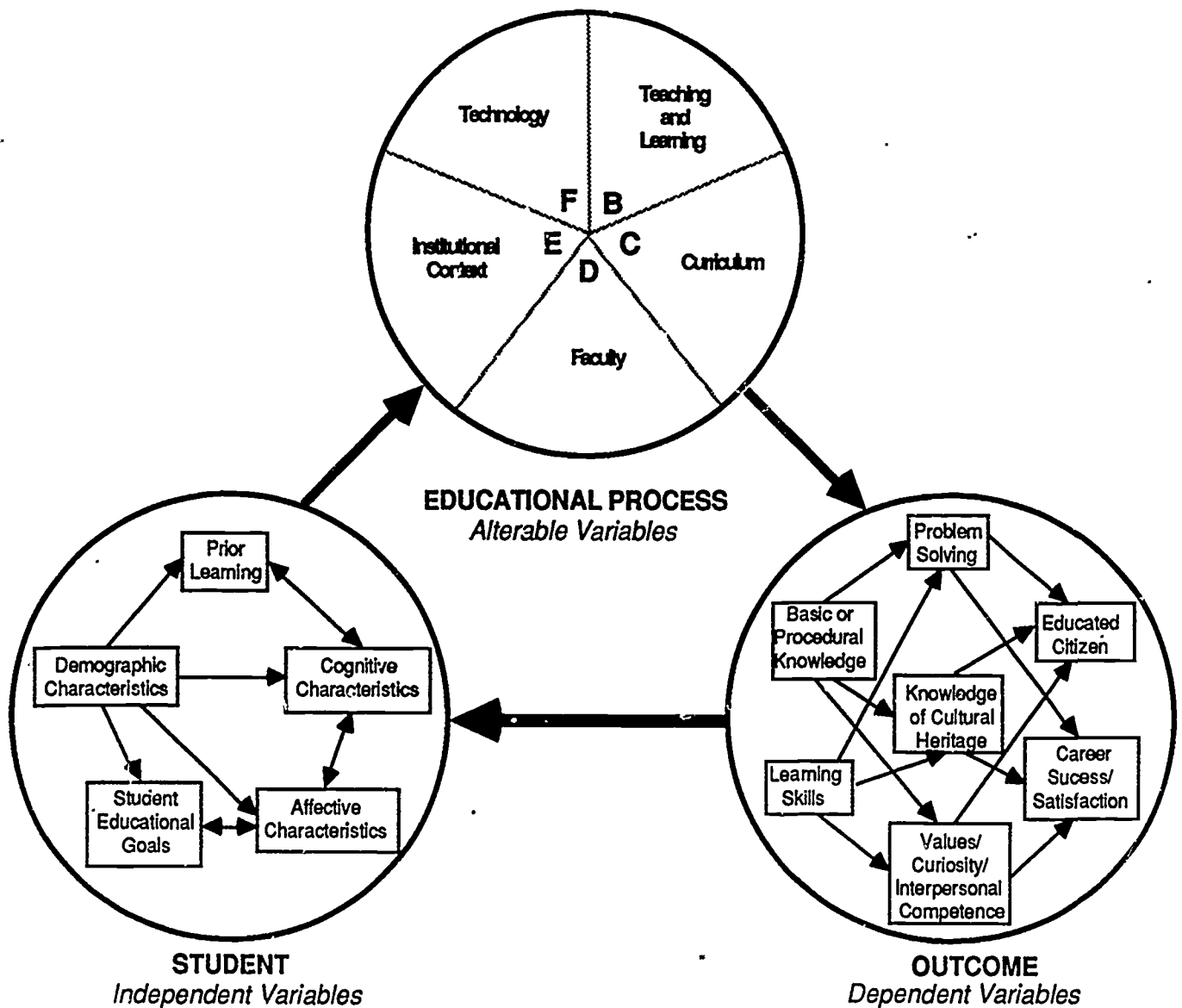


Figure 1. Variables in NCRIPAL's Research Agenda

I. Issues of Student Learning

The NCRIPAL 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?

General references for institutional leaders

Astin, A. W. (1984). *Achieving Educational Excellence*. San Francisco: Jossey-Bass.

Pace, C. R. (1984). *Measuring the Quality of Student Experience*. Los Angeles: University of California. Higher Education Research Institute.

Richardson, R., Flisk, E. C., & Okun, M. A. (1983). *Literacy in the Open Access College*. San Francisco: Jossey-Bass.

References specifically for researchers

McKeachie, W. J., Pintrich, P. R., & Lin, Y. (1985). Teaching learning strategies. *Educational Psychologist*, 20(3), 153-160.

Pintrich, P. R., Cross, D. R., Kozma, R. B., & McKeachie, W. J. (1986). Instructional psychology. *Annual Review of Psychology*, 37, 611-651.

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?

General references for institutional leaders

Costa, A. L. (Ed.). (1985). *Developing minds: A resource book for teaching thinking*. Washington, DC: Association for Supervision and Curriculum Development.

Kolb, D. A. (1981). Learning styles and disciplinary differences. In A. W. Chickering and Associates, *The modern American college*. San Francisco: Jossey-Bass.

Marton, F., Hounsell, D., & Entwistle, N. (Eds.). (1984). *The experience of learning*. Edinburgh: Scottish Academic Press.

Perry, W. G., Jr. (1970). *Forms of intellectual and ethical development in the college years: A scheme*. New York: Holt, Rinehart and Winston.

Winne, P. H. (1985). Cognitive processing in the classroom. In T. Husen, and T. N. Postlethwaite (Eds.), *The international encyclopedia of education* (pp. 795-808). New York: Pergamon Press.

References specifically for researchers

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122-147.

Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology*, 41, 586-598.

Keeley, S. M., Browne, M. N., & Kreutzer, J. S. (1982). A comparison of freshmen and seniors on general and specific essay tests of critical thinking. *Research in Higher Education*, 17(2), 139-154.

Maimon, E. P., Belcher, G. L., Hearn, G. W., Nodine, B. F., & O'Connor, F. W. (1981). *Writing in the arts and sciences*. Cambridge, MA: Winthrop.

McKeachie, W. J., Pintrich, P. R., & Lin, Y. (1985). Learning to learn. In G. d'Ydewelle (Ed.), *Cognition, information processing and motivation* (pp.601-618). North Holland: Elsevier Science Publishers.

McKeachie, W. J., Pintrich, P. R., & Lin, Y. (1985). Teaching learning strategies. *Educational Psychologist*, 20(3), 153-160.

McMillan, J. H. (1986, April). *Enhancing college students' critical thinking: A review of studies*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Stonewater, J. K., & Stonewater, B. B. (1984). Teaching problem-solving: Implications from cognitive development research. *AAHE/ERIC Higher Education Research Currents*. AAHE Bulletin, 7-10, February 1984.

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?

General references for institutional leaders

Chickering, A. W., & Associates. (1981). *The modern American college*. San Francisco: Jossey-Bass.

Cronbach, L., & Snow, R. (1977). *Aptitudes and instructional methods: A handbook for research on interaction*. New York: Irvington.

Wittrock, M. (Ed.). (1986). *The handbook of research on teaching* (3rd. ed.). New York: Macmillan.

References specifically for researchers

Corno, L., & Snow, R. E. (1986). Adapting teaching to individual differences among learners. In M. Wittrock (Ed.), *The handbook of research on teaching*. New York: Macmillan.

Perry, W. G. (1981). Cognitive and ethical growth: The making of meaning. In A. W. Chickering & Associates (Eds.), *The modern American college* (pp. 76-116). San Francisco: Jossey-Bass.

Smart, John C. (1985). Environments as reinforcement systems in collegiate settings: A test of Holland's theory. *Research in Higher Education*, 23(3), 279-292.

Stinard, T. A., & Dolphin, W. D. (1981). Which students benefit from self-mastery instruction and why. *Journal of Educational Psychology*, 73(5), 754-763.

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?

General references for institutional leaders

Ewell, P. T. (1983). *Information on student outcomes: How to get it and how to use it*. Boulder, CO: National Center for Higher Education Management Systems.

Ewell, P. T. (1984). *The self-regarding institution: Information for excellence*. Boulder, CO: National Center for Higher Education Management Systems.

Ewell, P. T. (1985). Assessment: What's it all about? *Change*, 17(6), 32-36.

Mentkowski, M., & Loacker, G. (1985). Assessing and validating the outcomes of college. In P.T. Ewell (Ed.), *Assessing educational outcomes* (pp. 47-64). *New Directions for Institutional Research*, No. 47. San Francisco: Jossey-Bass.

Northeast Missouri State University. (1984). *In pursuit of degrees with integrity: A value-added approach to undergraduate assessment*. Washington, DC: American Association of Colleges and Universities.

References specifically for researchers

Astin, A. W. (1977). *Four critical years: Effects of colleges on beliefs, attitudes, and knowledge*. San Francisco: Jossey-Bass.

Durnout, R. G., & Troelstrup, R. L. (1980). Exploring relationships between objective and subjective measures of instructional outcomes. *Research in Higher Education*, 12, 37-51.

Ewell, P. T. (Ed.). (1985). *Assessing outcomes*. *New Directions for Institutional Research*. No. 47. San Francisco: Jossey-Bass.

Mentkowski, M., Moesner, M., & Stratt, M. J. (1983). *Using the Perry Scheme of intellectual and ethical development as a college outcomes measure: A process and criteria for judging student performance*. (Vols. 1 & 2). Milwaukee, WI: Alverno College Productions.

Pace, C. R. (1979). *Measuring outcomes of college*. San Francisco: Jossey-Bass.

Pascarella, E. (1986). College environmental influences on learning and cognitive development: A critical review and synthesis. In J. C. Smart (Ed.), *Higher education: Handbook of theory and Research*, 1, 1-61. New York: Agathon Press.

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 NCRIPAL 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 curricular 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?

General references for institutional leaders.

Chickering, A. W., Halliburton, D., Bergquist, W. H., & Lindquist, J. (1977). *Developing the college curriculum*. Washington, DC: Council for the Advancement of Small Colleges.

Dressel, P. L., & Marcus, D. (1982). *Teaching and learning in college*. San Francisco: Jossey-Bass.

Gay, G. (1980). Conceptual models of the curriculum planning process. In A. W. Foshat (Ed.), *Considered action for curriculum improvement* (pp. 120-143).

Washington, DC: Association for Supervision and Curriculum Development.

Winter, D. G., McClelland, D. C., & Stewart, A. J. (1982). *A new case for the liberal arts*. San Francisco: Jossey-Bass.

References specifically for researchers

Conrad, C. F., & Pratt, A. M. (1986). Research on academic programs: An inquiry into an emerging field. In J. M. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 2) (pp. 235-274).

Dill, D. D., & Friedman, C. P. (1979). An analysis of frameworks for research on innovation and change in higher education. *Review of Educational Research*, 49, 411-435.

Posner, G. J. (1985). Pacing and sequencing class activities. In T. Husen and T. N. Postlethwaite (Eds.), *The international encyclopedia of education* (pp. 1223-1227). New York: Pergamon Press.

Toombs, W. (1977-78). The application of design-based curriculum analysis to general education. *Higher Education Review*, 1, 18-29.

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?

General references for institutional leaders

Carnegie Foundation for the Advancement of Teaching. (1985). General education: New support growing on campuses. *Change*, 17(6), 27-30.

College Board. (1983). *Academic preparation for college: What students need to know and be able to do*. New York: The College Board.

Cobb, W. D. (1983). General education: Purpose and perspectives. *Liberal Education*, 69(4), 353-367.

Gaff, J. G. (1983). *General education today: A critical analysis of controversial practices and reforms*. San Francisco: Jossey-Bass.

Gamson, Z., & Associates. (1984). *Liberating education*. San Francisco: Jossey-Bass.

Johnson, B. L. (Ed.). (1982). General education in two-year colleges. *New Directions for Community Colleges*, No. 40. San Francisco: Jossey-Bass.

Mentkowski, M., & Much, N. (1982). *Student perspectives on liberal learning at Alverno College: Justifying learning as relevant to performance in personal and professional roles*. Milwaukee, WI: Alverno College Productions.

References specifically for researchers

Hursh, B., Haas, P., & Moore, M. (1983). An interdisciplinary model to implement general education. *Journal of Higher Education* 54(1), 42-59.

Kuh, G. D. (1981). *Indices of quality in the undergraduate experience*. AAHE/ERIC Research Report #4. Washington, DC: American Association for Higher Education.

Pascarella, E. T. (1985). College environmental influences on learning and cognitive development: A critical review and synthesis. In J. C. Smart (Ed.), *Handbook of research and theory in higher education*, 1-62.

Posner, G. J., & Rudnitsky, A. N. (1981). *Course design: A guide to curriculum development for teachers* (2nd. Ed). New York: Longman.

Vars, G. F. (1982). Designs for general education: Alternative approaches to curriculum integration. *Journal of Higher Education*, 53, 216-226.

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?

General references for institutional leaders

Conrad, C. F., & Wyer, J. C. (1980). *Liberal education in transition*. AAHE/ERIC Research Report No. 3. Washington: American Association for Higher Education.

Meyerson, M. (1974). Civilizing education: Uniting liberal and professional learning. *Daedalus* (Special Issue) American Higher Education: Towards an Uncertain Future, pp. 173-179.

Stark, J. S., Lowther, M. A., & Hagerty, B. M. K. (1986). *Responsive professional education: balancing outcomes and opportunities*. ASHE/ERIC Higher Education Report No. 3. Washington, DC: Association for the Study of Higher Education.

References specifically for researchers

Chickering, A. W. (1981). Integrating liberal education, work and human development. *AAHE Bulletin*, 33,7.

Kimball, B. A. (1981). *A historical and typological analysis of ideas of liberal education in America*. Unpublished doctoral dissertation, Harvard University, Cambridge, MA.

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?

General references for institutional leaders

Pace, C. R. (1979). *Measuring outcomes of college*. San Francisco: Jossey-Bass.

References specifically for researchers

Donald, J. G. (1983). Knowledge structures: Methods for exploring course content. *Journal of Higher Education*, 54(1), 31-41.

Gowin, D. B. (1980). The structure of knowledge. *Educational Theory* 20, 315-328.

Ward, S. A., & Reed, L. J. (Eds.). (1983). *Knowledge structure and use: implications for synthesis and interpretation*. Philadelphia: Temple University Press.

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; Laúd & 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?

General references for institutional leaders

Bowen, H., & Schuster, J. (1986). *American professors: A national resource imperiled*. New York: Oxford University Press.

Cross, P. K. (1986). *Taking teaching seriously*. Address given at the annual meeting of the American Association for Higher Education, Washington, DC, March, 1986.

References specifically for researchers

Donald, J., & Sullivan, A. (Eds.). (forthcoming). Using research to improve university teaching. *New Directions in Teaching and Learning*. San Francisco: Jossey-Bass.

Finkelstein, M. (1984). *The American academic profession*. Columbus, OH: Ohio State University Press.

Gullette, M. M. (Ed.). (1982). *The art and craft of teaching*. Cambridge, MA: Harvard-Danforth Center for Teaching and Learning.

Malone, T. W., & Lepper, M. R. (forthcoming). Making learning fun: A taxonomy of intrinsic motivations for learning. In R. G. Snow & M. J. Far (Eds.), *Aptitude, learning, and instruction: III. Cognitive and affective process analysis*. Hillsdale, NJ: Erlbaum.

McKeachie, W. J. (1986). One-on-one teaching and counseling. In *Teaching tips: A guidebook for the beginning teacher* (8th ed.), pp. 135-142. Lexington, MA: D. C. Heath.

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?

General references for institutional leaders

Baldwin, R. G., & Blackburn, R. T. (Eds.). (1983). *College faculty: Versatile human resources in a period of restraint*. *New Directions for Institutional Research*. San Francisco: Jossey-Bass.

Centra, J. (1980). *Determining faculty effectiveness*. San Francisco: Jossey-Bass.

Davis, B. G., Wood, L., & Wilson, R. C. (1983). *ABCs of teaching with excellence*. Berkeley, CA: University of California.

Doyle, K. O. (1983). *Evaluating teaching*. Lexington, MA: D. C. Heath.

Erickson, S. C. (1984). *The essence of good teaching*. San Francisco: Jossey-Bass.

McKeachie, W. J. (1979). Student ratings of faculty: A reprise. *Academe*, 65, 384-397.

References specifically for researchers

Blackburn, R., & Clark, M. J. (1975). An assessment of faculty performance: Some correlations between administrative, collegial, student, and self-ratings. *Sociology of Education*, 48, 242-256.

Marsh, H. W. (1984). Students' evaluations of university teaching: Dimensionality, reliability, validity, potential biases, and utility. *Journal of Educational Psychology*, 76, 707-754.

Marsh, H. W., & Hocevar, D. (1984). The factorial invariance of student evaluations of college teaching. *American Educational Research Journal*, 21(2), 341-366.

McKeachie, W. J., Lin, Y-G., Daugherty, M., Moffett, M., Neigler, C., Norx, J., Walz, M., & Baldwin, R. (1980). Using student ratings and consultation to improve instruction. *British Journal of Educational Psychology*, 50, 168-174.

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?

General references for institutional leaders

Boyer, C. M., & Lewis, D. R. (1985). *And on the seventh day: Faculty consulting and supplemental income*. ASHE/ERIC Higher Education Reports No. 3. Washington, DC: Association for the Study of Higher Education.

References specifically for researchers

Schustereit, R. (1980). Team-teaching and academic achievement. *Improving College and University Teaching*, 28, 85-89.

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 stream-

lined to allow academic leaders to focus greater effort on instructional leadership?

General references for institutional leaders

Bennett, J. B. (1982). Ambiguity and abrupt transitions in the department chairperson's role. *Educational Record*, 63(4), 53-56.

Kerr, C. (1982). Crisis in leadership. *AGB Reports*, 24(4), 4-7.

Mocre, K. M. (1983). *Leaders in transition: A national study of higher education administrators*. University Park, PA: The Pennsylvania State University Center for the Study of Higher Education.

Tucker, A. (1984). *Chairing the academic department*. New York: Macmillan.

Whetten, D. A. & Cameron, K. S. (1985). Administrative effectiveness in higher education. *The Review of Higher Education*, 9(1), 35-49.

References Specifically for Researchers

Batlis, N. C. (1980). The effect of organizational climate on job satisfaction, anxiety, and propensity to leave. *The Journal of Psychology*, 104, 233-240.

Moomaw, E. W. (1984). Participatory leadership strategy. *New Directions for Higher Education*, 12(3), 19-30.

Sagaria, M. A. D. (1984). Academic staff job change: Winning characteristics in organizational musical chairs. *Research in Higher Education*, 21(2), 137-149.

Terpstra, D. E., Olson, P. D., & Lockeman, B. (1982). The effects of MBO on levels of performance and satisfaction among university faculty. *Group & Organization Studies*, 7, 353-366.

Welsch, H. P., & LaVan, H. (1981). Interrelationships between organizational commitment and job characteristics, job satisfaction, professional behavior, and organizational climate. *Human Relations*, 34, 1079-1089.

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?

General references for institutional leaders

Ayres, W. G., & Bennett, K. W. (1983). University characteristics and student achievement. *Journal of Higher Education*, 54(5), 516-532.

Cameron, K. S. (1985). Institutional effectiveness in higher education: An introduction. *The Review of Higher Education*, 9(1), 1-4.

Fol, C. M., & Lyles, M. A. (1985). Organizational learning. *Academy of Management Review*, 10, 803-813.

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?

General references for institutional leaders

Blimling, G. S., & Dale, H. (1979). Structuring the peer environment in residence halls to increase academic performance in average-ability students. *Journal of College Student Personnel*, 20, 320-316.

Newcomb, T. M., Brown, D. R., Kulik, J. A., Reimer, D. J., & Revelle, W. R. (1971). The University of Michigan's Residential College. In P. L. Dressel (Ed.), *The new colleges: Toward an appraisal* (pp. 99-141). Iowa City: The American College Testing Program.

Nordvall, R. (1982). *The process of change in higher education institutions*. AAHE/ERIC Higher Education Research Report No.7. Washington, DC: American Association of Higher Education.

References specifically for researchers

Upadhyay, S. N. (1982). Environments in government and private colleges and student satisfaction. *Scientia Paedagogica Experimentalis*, 19(2), 319-334.

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?

General references for institutional leaders

Abrams, H. G., & Jernigan, L. P. (1984). Academic support services and the success of high-risk college

students. *American Educational Research Journal*, 21(2), 261-174.

Ayers, G. E. (1983). Critical issues: The illusion of equal access. *Planning and Changing*, 14(1), 49-55.

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?

General references for institutional leaders

Ellyson, E. J., Barr, R. E., & Bailey, E. R. (1982). Formula-based research incentive plans at colleges and universities. *Research in Higher Education*, 17, 241-248.

Newcombe, J. P., & Conrad, C. F. (1981). A theory of mandated academic change. *Journal of Higher Education*, 52(6), 555-577.

Vracking, W. J. (1985). Revamping organizations through cultural intervention. *Journal of Management Consulting*, 2(3), 10-16.

References specifically for researchers

Fine, G. A. (1984). Negotiated orders and organizational cultures. *Annual Review of Sociology*, 10, 239-262.

McAllister, P. R., & Wagner, D. A. (1981). Relationship between R & D expenditures and publication output for U.S. colleges and universities. *Research in Higher Education*, 15, 3-30.

Rugg, E. A., et al. (1981). Faculty orientations toward institutional goals: A broken front with implications for planned change. *Research in Higher Education*, 15(2), 161-173.

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?

General references for institutional leaders

Office of Technology Assessment. (1982). *Informational technology and its impact on American education*. Washington, DC: U.S. Government-Printing Office.

Taylor, R. (1980). *The computer in the school: Tutor, tool, and tutee*. New York: Teachers College Press.

References specifically for researchers

Kulik, J. A., Kulik, C. C., & Cohen, P. A. (1980). Effectiveness of computer-based college teaching: A meta-analysis of findings. *Review of Educational Research*, 50(4), 525-544.

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?

General references for institutional leaders

Howe, M. J. A. (1983). *Learning from television: Psychological and educational research*. Orlando, FL: Academic Press.

Johnston, J. (Ed.). (1984). *Evaluating the new information technologies*. New Directions for Program Evaluation, Number 23. San Francisco: Jossey-Bass.

Johnston, J., & Ettema, J. (in press). Using television to best advantage: Research for pro-social television. In J. B. Bryant & D. Zillman (Eds.), *Perspectives on media effects*. Hillsdale, NJ: Erlbaum.

Johnston, J., & Ettema, J. (1982). *Positive images: Breaking stereotypes with children's television*. Beverly Hills, CA: Sage.

References specifically for researchers

Bates, A. W. (1983). Adult learning from educational television: The open university experience. In M. J. Howe (Ed.), *Learning from television: Psychological and educational research*. Orlando, FL: Academic Press.

Chu, G. C., & Schramm. (1979). *Learning from television: What the research says* (4th ed.). Washington, DC: National Association of Educational Broadcasters.

Clark, R. E. (1983). Reconsidering research on learning from media. *Review of Educational Research*, 53(4), 445-459.

Kulik, C., & Kulik, J. A. (1985). *Effectiveness of computer-based education in colleges*. Unpublished manuscript, University of Michigan, Center for Research on Learning and Teaching, Ann Arbor, MI.

Salomon, G., & Garáner, H. (1984). *The computer as educator: Lessons from television research*. Cambridge, MA: Harvard Graduate School of Education.

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.

I. Appropriate Research Frameworks

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

References

Alexander, J. M., & Stark, J. S. (1986). *Focusing on student academic outcomes: A working paper*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

Blackburn, R. T., Lawrence, J. H., Ros, S., Okoloko, V. P., Bieber, J. P., Meiland, R., & Street, T. (1986). *Faculty as a key resource: A review of the research literature*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

Green, P. J., & Stark, J. S. (1986). *Approaches to research on the improvement of postsecondary teaching and learning*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

Gurin, G. R. (1986). *A review of the research on minorities in higher education*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

Johnston, J. (1986). *Electronic information; Literacy skills for a computer age*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

Korn, H. A. (1986). *Psychological models explaining the impact of college on students*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

McKeachie, W. J., Pintrich, P. R., Lin, Y., & Smith, D. A. F. (1986). *Teaching and learning in the college classroom: A review of the research literature*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

Peterson, M. W., Cameron, K. S., Mets, L. A., Jones, P., & Ettington, D. (1986). *The organizational context for teaching and learning: A review of the research literature*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

Stark, J. S., & Lowther, M. A., with Smith, S. (1986). *Designing the learning plan: A review of research and theory related to college curricula*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

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?

References

Mentkowski, M., & Loacker, G. (1985). Assessing and validating the outcomes of college. In P. T. Ewell (Ed.), *Assessing educational outcomes* (pp. 47-64). New Directions for Institutional Research, No. 47. San Francisco: Jossey-Bass.

Northeast Missouri State University. (1984). *In pursuit of degrees with integrity: A value-added approach to undergraduate assessment*. Washington, DC: American Association of Colleges and Universities.

Winter, D. G., McClelland, D. C., & Stewart, A. J. (1982). *A new case for liberal arts*. San Francisco: Jossey-Bass.

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?

References

Alexander, J. M., & Stark, J. S. (1986). *Focusing on academic outcomes*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

Astin, A. W. (1977). *Four critical years: Effects of*

colleges on beliefs, attitudes, and knowledge. San Francisco: Jossey-Bass.

McKeachie, W. J., Pintrich, P. R., Lin, Y., & Smith, D. A. F. (1986). *Teaching and learning in the college classroom: A review of the research literature*. Unpublished manuscript, University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI.

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?

General references for institutional leaders

Astin, A. W. (1977). *Four critical years: Effects of colleges on beliefs, attitudes, and knowledge*. San Francisco: Jossey-Bass.

References specifically for researchers

Ewell, P. (1983). *Information on student outcomes: How to get it and how to use it*. Boulder, CO: National Center for Higher Education Management Systems.

General References Cited in Text

- Adelman, C. (1985). *The standardized test scores of college graduates, 1964-1982*. Washington, DC: National Institute of Education and American Association for Higher Education.
- Adelman, C. (1984). *Starting with students: Promising approaches in American higher education*. Washington, DC: National Institute of Education and American Association for Higher Education.
- Association of American Colleges. (1985, February). *Integrity in the college curriculum: A report to the academic community*. Washington, DC: Association of American Colleges.
- Bennett, W. (1984). *To reclaim a legacy*. Washington, DC: National Endowment for the Humanities.
- Bowen, H., & Schuster, J. (1986). *American professors: A national resource imperiled*. New York: Oxford University Press.
- College Board. (1983). *Academic preparation for college: What students need to know and be able to do*. New York: The College Board.
- Finkelstein, M. (1984). *The American academic profession*. Columbus, OH: Ohio State University Press.
- Hefferlin, J. L. (1969). *The dynamics of academic reform*. San Francisco: Jossey-Bass.
- Ladd, E., Jr., & Lipset, S. M. (1975). *The divided academy: Professors and politics*. New York: McGraw-Hill.
- Moore, K. M. (1983). *Leaders in transition: A national study of higher education administrators*. University Park, PA: The Pennsylvania State University Center for the Study of Higher Education.
- National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform*. Washington, DC: U.S. Department of Education.
- NIE Study Group on the Conditions of Excellence in American Higher Education. (1984). *Involvement in learning: Realizing the potential of American higher education*. Washington, DC: National Institute of Education and American Association for Higher Education.