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ABSTRACT

Five mission statements for proposed National Institute of Education-supported research centers on postsecondary education are presented to the Director of the National Institute of Education (NIE). Mission statements are provided for the following proposed centers: Center for Research on Postsecondary Learning, Center on Investments in Education and Training for a Stronger Economy, Center for the Study of Finance and Governance in Postsecondary Education, Center on the Research Enterprise in Higher Education, and Center for Research on Postsecondary Education Facilities. Recommendations of the lab and center study group include: (1) regional laboratories should include all sectors of education within their scope and service; (2) NIE should consider sponsoring center research programs in five areas (postsecondary learning; education, the workforce, and productivity; postsecondary governance and finance; research; and facilities); (3) five principles should be followed in organizing the competition for labs and centers (quality of staff, flexibility, coherence and continuity, center cooperation, and dissemination); (4) NIE should conduct a series of staff studies, regional workshops, and conferences focusing on how colleges might evaluate and test products, services and technologies; and (5) parallel research activities that complement the work of the centers should be supported. (SW)

RECOMMENDATIONS OF THE CENTER STUDY GROUP ON POSTSECONDARY EDUCATION

Letter of Transmittal and Executive Summary;
Description of Five Proposed Research Centers

Submitted to:

Dr. Manuel J. Justiz
Director
National Institute of Education

September 30, 1983

Dr. Manuel J. Justiz
Director, National Institute of Education
1200 19th St., N.W.
Washington, D.C. 20208

September 30, 1983

Dear Dr. Justiz,

On behalf of the Lab and Center Study Group for Postsecondary Education, I am pleased to forward you five mission statements for proposed Centers for research on matters of great concern to postsecondary educators. This letter of transmittal is intended as an executive summary of our work, includes a rationale for our general approach and offers some specific suggestions on matters relating to both the Lab and Center competition and other related activities of the NIE.

While this document summarizes the mission statements we have developed, we urge you, your colleagues, and the wider community of interest to read the full documents themselves, as we believe they offer far stronger arguments than we can present in such a limited space as this.

Postsecondary education in America is a $180 billion dollar business (6.0% of the Gross National Product). In any one year, it serves 12 million students in over 3300 colleges, community colleges and universities, more than a million individuals in education and training programs of the military, more than a million in 5500 proprietary institutions, and a minimum of 5 million others in formal education and training programs of American business, industry, public agencies, hospitals and unions. Seven out of ten high school graduates of the Class of 1983 will receive a <u>minimum</u> of one year of postsecondary education by 1990.

The charge to the Lab and Center Study Group for Postsecondary Education was to explore the kinds of research which are essential to taking full advantage of this important investment in America's future.

In the final report on its work, A Nation at Risk, the National Commission on Excellence in Education advocated the advancement of the United States as a "learning society," one in which the search for excellence in education does not stop after the age of compulsory schooling. Indeed, the figures we cited above indicate that millions of Americans are finding postsecondary education necessary at various points in their lives and careers.

But in the course of its work, the National Commission also found some disturbing trends in postsecondary education, including falling scores of college graduates on standardized achievement tests and the testimony of many employers concerning the necessity for retraining those graduates in subjects ranging from foreign languages to finance to communication skills of all kinds, for orienting them to the nature of work, and for building with them such capacities as adaptability, tolerance for ambiguity, and persistence. If individuals and the Nation are to make such a large and important investment in postsecondary education as indicated by the figures we cite, then we all have the obligation to improve the yield from that investment.

Our Study Group firmly believes that that improvement must rest on a far less fragmented and anecdotal knowledge base than we currently possess. We can no longer afford to substitute assumptions for wisdom, can no longer afford to be complacent about our ignorance, and can no longer afford the artificial barriers between levels and sectors of education that prevent us from perceiving the continuum that defines the "learning society."

Our Study Group has carefully reviewed the critical issues facing postsecondary education, discussed the testimony offered at the public hearings conducted as part of the Lab and Center Competition planning process, solicited opinion from many colleagues, identified the most critical gaps in our knowledge and practice, and unanimously recommends the following:

1) Regional laboratories should include all sectors of education within their scope of service, thus eliminating the artificial barriers and recognizing the interdependence of primary, secondary and postsecondary education. Successful offerors within the Laboratory competition should evidence a demonstrated ability to serve postsecondary institutions.

2) NIE should give serious consideration to sponsoring programs of research in Centers devoted to the five (5) critical areas listed below without any indication of preference.

Common to all five proposed Centers are such organizational characteristics as modest scale, a small core staff augmented by visiting professionals (both researchers and practitioners), and vigorous and imaginative dissemination components.

(a) Postsecondary Learning. Our knowledge of what students learn after high school, how they learn it, and the institutional environments and educational practices which best serve their needs is sparse, fragmented and inaccessible. This Center will conduct research on the outcomes of postsecondary education for different kinds of learners in different types of institutions and under different instructional practices. It will thus fill a critical knowledge need in a time of increasing diversity in the student population.

Studies of student outcomes would include such topics as:

- o improvement during the college years in specific knowledge in the basic disciplines;
- o competence for social roles in the workplace, the family and the community, and
- o longer-term growth in generic capacities such as analytic reasoning and synthetic thinking.

The research would also examine the effect of external circumstances (e.g. employment and family obligations),

institutional characteristics of both collegiate and non-collegiate settings, and instructional practices (e.g. course requirements and academic advisement) on student learning. In all these activities, the Center would draw, where appropriate, on studies of postsecondary student learning in other nations, and on the efforts of projects sponsored by the National Endowment for the Humanities and the National Science Foundation.

(b) Education, the Workforce, and Productivity. No single institution is currently analyzing changing national economic needs and working back to the hard question about which education and training programs might best meet those needs. The proposed Center would identify particular labor force groups in need of education and training services (demand), particularly in light of emerging technologies, and evaluate the best alternatives for meeting those demands (supply). While its focus would not be limited to postsecondary education, its research would place considerable emphasis on the roles of community colleges, proprietary schools, the military, and corporations in its evaluation of alternate solutions to workforce education and training needs.

Indeed, since the work of the Center would cover all levels of education, training and skills, it could develop basic lines of inquiry on problems such as "critical shortages" of certain types of workers that could involve research on topics ranging from high school counseling to continuing education for professionals. Such lines of inquiry would also be informed by similar studies in other industrially advanced, democratic nations.

Thus, the studies to be conducted would look at education/economic problems through the glasses of both educators and economists, and would be the springboard for much more informed discussions of the potential and limits of education for increasing the productivity and improving the utilization of our nation's workforce.

(c) Postsecondary Governance and Finance. Because the funding of postsecondary education relies on so many sources (families, endowment incomes and private giving, institutional and student assistance from governments, overhead on contracts, rents and royalties, etc.), the finance and governance of the enterprise is much more varied than it is at the school level.

The connection between what students learn and the governance of education at any level is critical. In order to serve students and society best, postsecondary education must revitalize its governance processes at the local level and redefine its external relationships. The existing research necessary to inform this task is inadequate.

The focus of the proposed research Center is on understanding how teaching, research and public service in postsecondary institutions are affected by the nature of institutional finance and governance and by the tug-of-war between autonomy and accountability. It could thus perform research on such topics as

- o the changing patterns of financing higher education;
- o interinstitutional and intersectoral relations (e.g. school/college cooperation or joint ventures between universities and corporations);
- o how the governance of state systems performs under conditions of academic retrenchment or collective bargaining; and
- o the impact of incentive funding on program improvement.

The Center would place a significant emphasis on the participation of practitioners in its activities, including a sabbatical program for college trustees, state legislators, and others who have held leadership roles in the governance of postsecondary education.

(d) Research. Our economy and society rely heavily on postsecondary institutions for the advancement of knowledge. Yet we have

rarely examined ways to maximize research outputs in educational environments, nor have we understood the ways in which research activity influences student learning. A Center addressing such issues is extraordinarily important to the vitality of higher education as an intellectual and scientific resource to the Nation.

The Center would conduct studies in three major areas:

- o the relationship between research, teaching, and student learning in different kinds of postsecondary institutions and in different types of programs (those in the disciplines, those in professional education, those in applied fields);
- o problems in the organization and finance of research, including the impact of federal science policy, the role of leadership in research communities, emerging patterns of research in industry, industry support for university research, state funding of research and the international division of labor in scholarship;
- o the recruitment, training, careers, and productivity of research personnel, including non-academic support staff and postdoctoral students, and addressing issues such as the aging of the research workforce, alternative career lines, and conflicts of interest.

Given the international dimensions of the research community, as well as the interests of other agencies, the national security community, Congressional committees, and disciplinary associations in the vitality of research in America, this Center will pay particular attention to comparative studies and will seek to disseminate its work in conjunction with activities of those groups.

(e) Facilities. There is a growing consensus that the degeneration of physical plant, coupled with new and different demands for educational facilities has become an extraordinarily important problem in campus administration. A Center that imaginatively combines the insights and specialists of academic planning, engineering, archi-

tecture, economics, construction finance and real estate development can lead to fundamentally new strategies for facilities development in postsecondary education.

This Center would set out a program of research organized around three broad time periods: the campus today; the campus through the 1980s, and the campus of the 21st Century. The projects to be undertaken would seek to examine, for example, the current effects of the physical environment on learning patterns and academic practices, the impact of changing demographics on the utilization of academic facilities in the year 2000, or the ways in which building standards can better define a useful academic building's life.

The consumers of the Centers' research would be both campus administrators and public officials charged with developing capital plans and budgets. The Center would thus encourage the collaboration of practical problem-solvers and imaginative academics concerned with the physical constraints of today's campuses.

3) In organizing the competition for Labs and Centers, we believe that five principles should be given critical attention:

a) Quality of Staff. The Lab and Center competition must attract the best researchers in the nation to investigate issues leading to educational excellence. Offerors should be judged on their ability to attract and effectively organize the best.

b) Flexibility. Each Center mission will present unique organizational requirements depending on the mission and status of the field, what is already known, how well it is integrated, the presence of research networks, and existing relationships among practitioners, policy-makers, and researchers. A uniform set of organizational requirements should not be prescribed, rather the principles of the competition should allow the

Director of NIE to determine which proposed organizational features best meet the needs of efficient research.

c) Coherence and Continuity. All Centers should present a coherent plan of work that evidences the continuity of knowledge as well as the creation of new knowledge. Each offeror should be required to demonstrate how synthesis, application, and assessment of rapidly changing bodies of knowledge will be accomplished. Where appropriate, too, offerors should follow the example of the National Commission on Excellence in Education, and demonstrate how they will draw on the experience and research of other nations to illuminate problems in American education.

d) Cross-Fertilization: Bridges Among Centers. Because education is a continuum, NIE should encourage joint ventures among centers. We also recognize that some of the issues we have identified as important for postsecondary education are also critical to primary and secondary education. In these instances, NIE might consider Centers that would be of service to all sectors. We also believe that, where appropriate, the work of the Centers should reach out to analogous and complementary efforts of such agencies as the National Endowment for the Humanities and the National Science Foundation.

e) Dissemination. The value of a research Center depends on its ability to create an informed clientele or a market for its findings. Offerors should be judged on their ability to create effective mechanisms for dissemination that reach beyond traditional methods of publication and distribution.

4) We strongly urge NIE and others within the Postsecondary sector of the Department of Education to support parallel research activities that complement and augment the work to be performed by the Centers.

From the considerable number of potential research topics we

considered, we have recommended only those we judged to be best treated in long-term institutional relationships. Others are better addressed through mechanisms such as grants, contracts, staff studies and commissioned papers.

5) The NIE should consider extraordinary means to provide reliable and useful information for educational research and practice. A major role of the Federal government must be to collect, report on, and analyze accurate educational data. No Center will prove successful--indeed, few efforts to achieve excellence in education will prove lasting--unless we understand better the actual scale of the educational process and determine the baselines for measuring change. A first step would be to ask the National Academy of Sciences to assess the quality of current educational data, to suggest the kinds of data series that ought to be maintained, to reconsider the processes by which such data are collected in many agencies and to recommend reporting capacities that would be useful to the educational community at large.

6) The NIE should conduct a series of staff studies, regional workshops and conferences focusing on how postsecondary institutions might collectively evaluate and test the increasing number of products, services and technologies they regularly purchase. What we have in mind, frankly, is testing the practicality of a consumers union which sets standards and evaluates products and services.

In closing, may I thank you for inviting our committee to explore broadly alternative avenues of research that could be of significance for the postsecondary community, for the opportunity to participate in a wise and timely process of planning the Lab and Center competition, and for the outstanding staff assistance we received from Cliff Adelman and John Wirt. We hope our final thoughts will help you; but if there is any other way we may advance this effort, do let us know.

Sincerely,

Barbara Newell (Chair)
Chancellor of Higher Education
State of Florida, on behalf of:

Adrienne Bailey
Vice President for Academic Affairs
The College Board

Robert Berdahl, Director,
Institute for Research in Higher and Adult Education
The University of Maryland

Arthur Chickering, Director,
Center for the Study of Higher Education
Memphis State University

Robert Gale, President,
Association of Governing Boards of Universities and Colleges

Zelda Gamson, Professor,
Center for the Study of Higher Education
The University of Michigan

James Medoff, Professor,
Department of Economics
Harvard University

Ann Reynolds, Chancellor,
The California State University

Daniel Saks, Professor,
Economics and Education Policy
Vanderbilt University

Martin Trow, Director,
Center for Studies in Higher Education
Univ. of California at Berkeley

Robert Zemsky, Director,
Higher Education Finance Research Institute
The University of Pennsylvania

Center for Research on Postsecondary Learning

The Problem

Our knowledge of what students learn after high school, how they learn it, and the institutional environments and educational practices which best serve their learning needs is sparse, fragmented and inaccessible to both policy makers and practitioners. Postsecondary education thus too often rests on trial and error efforts of combinations of individuals, institutions and educational practices that are guided by intuition and unexamined assumptions. It is rarely informed by systematic research.

Consider, for example, the following questions:

- What teaching practices best lead to the minimum competencies in basic skills currently being mandated by state legislatures and governing boards for college students? What investments of time and dollars are required to teach these basic skills more effectively to a wide range of student groups, including: (a) illiterate, unskilled workers? (b) underprepared urban black high school graduates? (c) isolated young adults in rural areas, and (d) Hispanics and other language minorities?
- What student-faculty relationships, peer support networks, and faculty characteristics are required for students to achieve the objectives of general education and the competencies necessary for effective citizenship?
- What combinations of curricular content and educational processes best foster the generic cognitive skills, interpersonal

competence, and motivation required for success in white-collar work?

- o What combinations of rewards, resources and sanctions can maximize both desired learning objectives for students and research productivity in four-year colleges and universities?

We cannot fully answer any of these questions with the current state of knowledge. And yet such questions as these will become increasingly urgent as our postsecondary learners become older, more ethnically diverse, and more likely to change careers two or three times; and questions such as these will become increasingly urgent as more and different institutions in our society (corporations, public agencies, the military, hospitals, and labor unions) offer postsecondary education and training programs to this increasingly diverse population.

The Current State of Research

Much of the current research on learning outcomes, institutional environments and educational practices at the postsecondary level has ignored relevant studies at the elementary and secondary levels. It has also overlooked research in other industrialized, democratic nations. It is a fragmented body of work, draws heavily on white middle-or-upper-middle-class populations, and tends to be carried out within the framework of only one discipline. This research thus seldom addresses the interactions among the principal variables that influence what students learn after high school.

Existing studies of postsecondary learning outcomes also tend to concentrate on non-cognitive dimensions of learning such as attitudes and self-concept. We have rarely sought knowledge concerning what information students retain (e.g. in history, economics, biology or literature) or how well they develop generic cognitive capacities such as analytic reasoning or synthetic thinking.

Likewise, while current research studies many aspects of the context of postsecondary education, it has passed over some of increasing importance (e.g. the military, corporate education programs, and proprietary schools), and has drawn its conclusions from surveys and other quick and shallow measurements. Just as current studies of postsecondary learning outcomes are rarely related to educational contexts, the existing literature on educational contexts is rarely related to student learning.

The Research of this Center: Outcomes, Learners, Environments, Practices

What kinds of outcomes occur for different kinds of postsecondary learners through what kinds of environments and educational practices, and at what costs?

This question governs the research of the proposed Center. The interations among learning outcomes, individuals and learning activities need to be investigated in ways that can inform public policy, improve practices, and guide the allocation of scarce resources. The research

agenda of the Center would thus cover the four factors in the basic question:

(1) Outcomes. The framing of teaching and curricula in terms of outcomes is one of the significant advances in education over the past decade. The proposed Center starts with support for the study of learning outcomes at the postsecondary level. It would sponsor careful thinking and research on different conceptions of learning outcomes and on the conditions that lead to them. Among these might be studies of persistence; attainment of learners' educational objectives; attainment of educational objectives of different kinds of institutions; knowledge and competence for social roles in the workplace, in the family, in the community, and in the nation; improvement during the college years in specific skills and specific knowledge in the basic disciplines; and improvements over the longer term in generic capacities such as reasoning and self-direction.

(2) Learners. However they are defined, the outcomes of education depend on individual differences in how people learn and contextual differences in how they are taught. The Center would thus pursue research that explicitly attempts to trace the effects of individual differences on outcomes: of cognitive styles, motivation, age, gender, and race as they affect learning; and of psychological processes that lead to specific learning outcomes.

(3) Environments. Studies of the ways in which different educational environments define and shape outcomes have a particular relevance at the postsecondary level, and might include:

- o the effect of external circumstances (employment, family obligations, financial resources, community responsibilities) on learners;
- o the effect of external circumstances on institutions (pressures for accountability, financial stability, autonomy);
- o the effect of institutional missions, size, selectivity, resources, student characteristics and administrative structure; and
- o the effect of other institutional characteristics such as administrative attitudes and practices regarding teaching, departmental structures, attitudes of faculty toward teaching, teacher competence and morale, and intellectual community and diversity.

(4) Practices. Closer to the teaching and learning process are academic factors that we assume have a more direct impact on postsecondary learning outcomes: curricular structures, contents, sequences and requirements, pedagogy, and academic advising. The effectiveness of various instructional technologies would certainly be an emerging area for critical attention. Non-academic functions and processes of an institution, such as admissions and recruitment, orientation and counseling, and residential arrangements might also be investigated in studies of outcomes.

Characteristics of this Center: Dissemination and Institutional Development.

Though driven by a simple question, the potential research agenda of this Center as outlined above is broad and complex. The precise shape of the agenda, we believe, would be heavily influenced by the dissemination functions of the Center. That is, when research is undertaken with potential audiences and institutional implications in mind, hypotheses are more sharply framed, data analyses driven by both policy and practical questions occur more frequently, and subsequent dissemination activities are strengthened.

The key audiences for the fruits of this Center's research would be:

- o local, state, and national governing boards, coordinating commissions, and legislators;
- o administrators, teachers and support services professionals in the full range of postsecondary institutions and organizations;
- o producers of instructional materials, software and other educational resources, and
- o professional associations in higher education and postsecondary training.

Given these audiences, dissemination activities need to include not only publication through traditional journals and trade magazines but also through newsletters and other regular networking vehicles. But conferences, workshops and on-site consultation will be required to supplement these more traditional and simple forms of information sharing.

This non-traditional set of dissemination activities is anticipated in recognition of the fact that the research output of this Center can yield significant change in the delivery of postsecondary education in different institutions. Institutional change basically occurs through the adaptation of alternatives developed in other settings, an adaptation that proceeds by accretion and replacement. But such adaptation occurs best when the institutions involved in the research enterprise also work to develop improvements that can be shared with others institutions with similar combinations of learners, educational activities and objectives. To aid that process will be a principal objective of this Center.

Characteristics of the Center: Scope and Organization

Since one of the primary purposes of the research to be conducted in this Center is to overcome the fragmentation and narrow disciplinarity of previous research in this field, the emphasis of organization will be interdisciplinary and the scope of operations broad.

The staff would thus draw on experts in such disciplines as cognitive psychology, social psychology, sociology, anthropology, political science, history, philosophy, and economics and who are knowledgeable in such areas as learning theory, post-adolescent development, organizational processes, epistemology and educational history. The core staff should include professional expertise in research utilization, organizational innovation and adaptation, studies of

postsecondary learning in other nations, and cost analysis concerning basic postsecondary practices.

To insure both flexibility and responsiveness of the Center, the core staff would be supplemented by "professionals-in-residence," i.e. experienced researchers, practitioners or policy makers who come from institutions other than colleges and universities, and who would be at the Center for periods ranging from six months to two years. These "professionals-in-residence" would both carry out research and advise special projects which fall outside the competences of the core staff.

An Advisory Board would also keep the Center responsive, with top-level representation from business, labor, health and community service agencies, government at all levels, and higher education. The Board would review periodic syntheses of research and development in the postsecondary learning field and make recommendations to the staff about problems needing special attention. The Board would advise the staff about potential sources of funding and the marketability of the Center's products and publications. In this context, the Center would make efforts to link up with appropriate projects sponsored by the National Endowment for the Humanities and the National Science Foundation.

This scope and organization suggest that a budget $0.9-1.2 million annually would be required to undertake the activities envisioned. Approximately 30% and this budget would be required for core staff, 40% for "professionals-in-residence" and commissioned research, and the balance for dissemination, facilities, supplies, and overhead.

CENTER ON

INVESTMENTS IN EDUCATION AND TRAINING FOR A STRONGER ECONOMY

> Knowledge, learning, information, and skilled intelligence are the new raw materials of international commerce and are today spreading throughout the world as vigorously as miracle drugs, synthetic fertilizers, and blue jeans did earlier. If only to keep and improve on the slim competitive edge we still retain in world markets, we must dedicate ourselves to the reform of our educational system for the benefit of all--old and young alike, affluent and poor, majority and minority.
>
> National Commission on
> Excellence in Education
> April 26, 1983

No single institution can do more to increase the economic contribution of the U.S. work force than our country's educational system. Education and training, whether it is provided by schools, corporations, the military or other institutions, and whether it is financed publicly or privately, can greatly enhance the productivity of employed Americans. Education and training, no matter how provided or how financed, can help make our unemployed of all types employable.

There are myriad ways in which the U.S. can invest its scarce education and training resources in meeting labor force needs. Each of these investments in our nation's human capital has a cost to society. Each also produces a benefit to society. The list of possible investments is long relative to our limited pool of investment dollars. Society, like any investor, must pick and choose among the potential education or training investments.

The goal of the prosed center is to provide evidence about the best alternative education and training investments for improving its most important productive factor--its work force. The center will bring together educators, economists, and other social scientists, who

together will conduct the research to inform public and private decisionmakers about their best human-capital investment strategies. No single institution is currently analyzing national economic needs and working back to the hard questions about which education and training programs might best meet those needs.

A. Scope of the Research Field

The Center would integrate two lines of inquiry that rarely receive coordinated treatment. It would identify the particular labor force groups in need of educational services (the demand for education and training) and it would evaluate the best alternatives for meeting those demands (the supply of education and training). The object would be to provide information by labor force group on what types of education and training represent the best societal investments and how it should be organized and financed.

We think of a center pursuing research along two dimensions of a matrix. The columns represent groups who have specific educational requirements that are expanding or contracting. These groups would be defined by demographic, geographical, occupational, industrial, socio-economic, or other characteristics (e.g., prime-age dislocated blue-collar workers, unemployed youth, older white-collar workers with no advancement opportunities, etc.).

The rows of the matrix would represent the alternative ways of meeting that group's educational requirements. These alternatives would be identified by institutional characteristics (vocational education, community colleges, secondary schools, alternative schools, proprietary schools, corporations, etc.) and by types of program (counselling, manual skills, basic literacy, computerized drill and practice, etc.)

Not every cell would be studied, but the center would be responsible for enumerating the overall dimensions of the matrix as well as conducting specific investigations on the most important cells. Work on particular

cells would include an assessment of the social costs and social benefits from the potential investment in human capital.

B. Scale of the Research

Tracking the economic, demographic, and other problems that might have education solutions and integrating that analysis with an analysis of effective programs and policies would require a considerable amount of analytical resources. Since such a center would not only project demands but also evaluate alternate solutions, it is necessary to have great flexibility in pursuing relevant research. This could not be accomplished through normal contracting procedures. Furthermore, linking demand analysis to supply analysis will require intellectual leadership and a creative organizational structure that could not evolve outside of a center.

A center devoted whether wholly or in part to the answering of these questions would necessarily devote considerable resources to basic inquiry. What is not needed is a center devoted to the collection of more data. Rather, such a center would lead to the development of new research skills and techniques uniquely combining the perspectives of the economist, demographer, sociologist and institutional researcher. Their work would, for instance, lead to new estimates of the demand for educational services thus informing schools and colleges how many students they must be prepared to teach, the kinds of jobs and careers likely to be open to students in the 1990s and beyond, and the special characteristics of the learning population over the next two decades. It would also lead to guidance about effective programs for those groups.

C. Potential Topics

The potential topics to be addressed by the proposed center can be labeled "demand side" and "supply side" although proposals for the center should be heavily judged on how well the two types of analysis are integrated. Examples of each type of topic can be given.

1. Demand

Here the key issues involve understanding the education and training requirements of the jobs available in our economy and understanding the education and training background of the country's employed and unemployed workers. These issues necessitate knowledge of the industrial and occupational mix of the work force. They require an understanding of the education and training requirements of emerging technologies. They also necessitate information on the changing demographic structure of the work force. And finally, they require the collection of information about the educational strengths and weaknesses of various labor force groups.

2. Supply

What is the best way to meet a group's educational needs? There is often an obvious answer from the many traditional institutions that automatically assume they own part of the market. But this center would evaluate non-traditional answers from the public or private sector and it would carry out such an evaluation based on its own analysis of the source of the special need and why the political or economic market is failing to meet such needs currently. These problems might not always have educational solutions.

3. Examples of Integrated Research

The center would cover all levels of education, training, or skills. Let us now take three examples of research topics that might be selected by the center: teenage unemployment, skill shortages, and the continuing education of professionals.

Youth Unemployment. There is a serious problem for many of our country's young who suffer from long-duration joblessness. It is often associated with poor basic skills and dropping out of school. Often these youth are placed or find their way into vocational education programs. When does this make sense? How should such programs be

organized? Is the "dual system" of work plus schooling (cooperative education) so favored in Germany the right solution for more youth here? Are expensive residential programs like Job Corps an answer? Should more be done to subsidize entry-level training and acquisition of basic skills within firms? Would a better middle school education prevent many of these problems? Are counselling programs beneficial? Under what circumstances? This sort of integrated analysis was undertaken by the Task Force on Youth Unemployment. But we should not have to wait for such rare events to get an integrated analysis of labor market problems and educational solutions.

Skill Shortages. One problem that receives considerable publicity is the perception of "critical shortages" of certain type of workers. Consider one highly publicized shortage group--machinists. Many argue that due to (1) the high retirement levels of the current group of machinists, (2) the insufficient training of new machinists, and (3) the increased demand for machinists by the military/industrial sector, there is a critical shortage of individuals with a machinist's skills. The National Tooling and Machining Association forecasts a shortage approaching a quarter of a million by 1985, astounding when one considers that there were not many more machinists than that in 1980. A center could evaluate the magnitude of the shortage and why the private interests might not be solving the problem if there is one. An independent center could examine whether new types of machinery will change training requirements, roles for the vocational system, community colleges, and corporate training programs in solving the problem, and whether some new financing mechanism is necessary to help industry solve the problem. Other perceived critical skill shortages could be identified and addressed.

The Continuing Education of Professionals. The rapid introduction of new technology into industry places highly educated professionals in the workforce at risk. Advances in knowledge and technology can quickly render obsolete the special skills that they must have to remain at the forefront or even in the mainstream of their professional disciplines. Sometimes, too, their whole industry can be threatened by the emergence

of a new competing industry based on a revolutionary, new technological development. Engineers are but one example of professionals who must continually keep up with new knowledge to maintain their employability and advance in their careers. Other professions from architecture to medicine are equally vulnerable.

Firms have a choice: they can either invest in retraining for their professional employees or shunt them aside for the newly minted graduates of colleges and universities who already have the technical skills and know-how required. Either choice has costs. Retraining is expensive but mature workers have experience not possessed by the young graduates. Differing corporate philosophies toward employee development and training are a major factor in the choice; so too are the tax policies of governments. The supply of retraining and professional development programs comes from a wide variety of sources: colleges have opened their doors to adults seeking courses or additional degrees, corporations run their own educational programs with their own instructors and curriculum, corporations also contract with colleges for specific programs, and many of the professional associations now have ambitious ranges of short-course and longer-term offerings.

A center that examines the demographics of the need for retraining in various professions and industrial sectors, charts the influence of technological change on this need, and compares the alternative modes of learning with respect to their costs and returns would be of great value. It would help professionals lead a long and productive worklife and it would help firms create the human resources that they need for adapting to the demands of a changing economy. Many similar issues concern groups of displaced blue-collar workers and "stuck" white-collar workers of all kinds.

D. Budget

In light of its mission and its likely needs, we feel that the proposed center would need a minimum of $1 million a year to operate effectively. This figure reflects the fact the center would be an umbrella for a wider diversity of knowledge and expertise than is typically found in an research enterprise.

E. Products, Audience, and Dissemination

The studies to be conducted by the proposed center will be unique in a number of ways. First and foremost, they will look at education/economic problems through the glasses of both educators and economists (or other social scientists). For this reason, the studies would be the spring board for much more informed discussions of the potential and limits of education for increasing the productivity and improving the utilization of our nation's work force. These discussions should benefit those engaged in educating and those responsible for getting the most from our human resources. Finally, it is hoped that the studies would help show the collectors of labor force and education statistics how best to collaborate.

The research to be conducted will involve representatives of the educational community, industry, labor and the government. These individuals should assist in the formation of the various studies to be conducted; moreover, they can be of great value in interpreting the studies.

Involving users in the production of studies will not only greatly improve the quality of the center's product--it will also greatly facilitate dissemination. Other ways of getting the product to the appropriate audience involve conferences, seminars, widely available working papers, articles in publications of all sorts, books, and the like. It is essential that the products produced by the proposed center not remain on a shelf to collect dust.

Center for the Study of Finance and Governance in Postsecondary Education

Problem

The connection between the quality and governance of education at any level is critical. What goes on in the classroom is heavily dependent on who determines (a) who is teaching, (b) what curriculum is offered, (c) what resources are available, and (d) what students are admitted. Who makes the decision and their knowledge of the learning environment determines much of the quality of what is learned.

The governance and finance of postsecondary education in America involves a substantially different set of relationships than that in elementary and secondary education. Because the funding of postsecondary education relies on so many sources (individuals and families, endowment incomes and private giving, county, state and federal governments, overhead on research contracts, and rents, royalties and user fees), the finance and governance of the enterprise is much more varied than it is at the school level.

The bottom line, though-- what students learn and the quality of research and public service in postsecondary institutions--is greatly influenced by the effectiveness with which each institution governs itself and deals with a host of external forces. We know that this linkage between educational quality and the mode of finance and governance exists, but we have yet to learn how it is working now and

how it may evolve in the future. The question of evolution is critical because the focus of decision-making in higher education has been changing. Evidence of that change over the past decade suggests more urgently that our knowledge concerning the effects of governance on learning, research, and public service needs to be greatly improved. Consider, for example:

- o Adopting programs of fiscal austerity, states have chosen not only across-the-board cuts in higher education assistance but also the more difficult and selective route of discontinuing programs. Who makes these choices and how they arrive at their judgments has significant consequences for both institutions and student choice.
- o Changing federal funding policies have obviously played a major role in the nature of the student body, in the balance of basic and applied research, and in the survival of institutions under severe fiscal stress as well as those experiencing internal management problems.
- o In adopting competency standards for high school graduates, community college transfer students, graduates of teacher education programs, and candidates for licensure in various occupations, state governments may be radically changing the ways in which postsecondary institutions teach, test, and advise their students.
- o After years of neglect, there has been a sudden surge of interest in cooperative programs between secondary schools and colleges for purposes of better student preparation and

curricular articulation; and a renaissance in joint ventures between universities and corporations, principally in research. Such changing relationships as implied in these examples create tensions between postsecondary institutions, with their historic concerns for academic freedom and autonomy, and governments, with their increasing emphases on accountability and the public interest.

The Current State of Research

In its recent volume, The Control of the Campus, the Carnegie Foundation for the Advancement of Teaching argues that in order to serve students and society best, higher education must revitalize its governance processes at the local level and redefine its relationships with external forces. The Carnegie agenda therefore includes recommendations both to strengthen internal governance through

- o stronger leadership from college presidents and chief academic officers;
- o more active roles for trustees;
- o improved faculty participation in governance;

and to re-examine the relationships between the academy and both executive and legislative branches of governments; the courts; regional and specialized accreditation agencies; and business, commerce, and industry.

The existing research necessary to engage in an informed strengthening and reexamination is inadequate to the task. It tends to concentrate on

selective aspects of Federal and state roles or on discrete aspects of local governance such as collective bargaining. It is often based on anecdotal information and takes the form of isolated case studies. Individual scholars and research teams can and have made helpful contributions, but they are no substitute for the coherence and continuity which would accompany the creation of an on-going research center.

The Research Agenda: Focus

The topics relevant to the work of a Center for Research on Finance and Governance in Postsecondary Education cover a vast range of issues. We recommend a clear focus on how the quality of the "core functions" of postsecondary institutions--teaching, research, and public service--is affected by the nature of institutional finance and governance. In many ways, this is the focus implicitly recommend by the National Commission on Excellence in Education in its discussion of leadership in American education: if the actors in the governance and finance system become more cognizant of the ways in which their decisions, their interactions, and the rules of the system in which they operate affect learning and research, then we all have a chance for adjusting the system to produce better learning and research.

A key example of this focus of the research agenda is the category of academic policies. Academic policies are those concerned with the nature, time and place of program offerings, standards (for admissions, transfer, and credentials), and learning resources (e.g. libraries and

computers). These are the major means through which institutions of postsecondary education seek to fulfill their missions or change directions and emphases and hence adapt to shifting conditions and constituencies.

Academic policies are determined along a continuum from the individual instructor through the department or division, school or college, district or system, and state legislative and executive branches; and may be influenced by federal agencies and regulations. In some aspects of academic policy, e.g. curriculum, instructors and departments may play the stronger role; in other areas, e.g. the requirements for occupational licensure that influence postsecondary programs, state legislatures and executive agencies may be the major actors. Since the steady pressure for accountability is likely to continue, what is needed is thorough knowledge of the ways decisions made on these different levels impact on each other and, ultimately, on the quality of student learning.

Even this canvas for research is broad. But the focus gives the proposed Center the opportunity to proceed with a systematic and selective program of research. Such a program would bring relevant theory (e.g. collective choice theory, collegial and political models of governance and decision-making, processes of organizational decision-making and behavior, and interorganizational relations) to bear on some very critical yet basic topics, for example:

o The <u>changing patterns of financing postsecondary education</u> and

their impact on the "core functions"--not only of colleges but also of proprietary schools and corporate education programs. The extent and impact of employee entitlement and incentive programs, merit-based financial aid, the portability of financial aid, and tuition equalization could be examined, with particular attention to their implications for student choice and for the competition between public and private postsecondary institutions.

o As postsecondary institutions fight aggressively to retain and enhance their share of the student market during a period of general enrollment decline, a critical question has emerged: who are the most effective monitors of quality?--The department? institutional administrators? The accrediting agency? The state coordinating agency? And how is quality in postsecondary education viewed by the different actors in the governance system?

The work of the National Commission on Excellence has brought questions like these to the fore. Our existing assumptions and patterns of control are under considerable strain, and studies are needed to anticipate, for example, the possible consequences of moving from proxy measures of institutional quality to real measures of student learning as the grounds of accreditation and program continuance. This center could perform such studies.

o How does campus and system governance in higher education perform

under conditions of academic retrenchment? The center might examine the changing roles of trustees, administrators, faculty, students and external constituencies under these circumstances, and then link its findings to the changing quality of teaching, research, and public service.

o With so much of postsecondary education ruled by enrollment-driven funding, it will be important for this center for assess and disseminate findings about both state and institutional practices of awarding discretionary funds to institutions for functions and achievements not directly linked to student credit hours. How does "incentive funding" affect rigorous self-assessment of academic program quality, inter-institutional cooperation, or access and services for the increasing number of part-time students?

o Over the past two decades, individual institutions have spawned branch campuses while other institutions with widely different educational and research roles have been grouped under single governing boards. What are the inherent organizational and financial tensions in multi-campus institutions and systems? The center could sponsor research on the comparative effectiveness of these governance relationships with reference to the "core functions" and missions of individual institutions.

Characteristics of this Center: Scope, Organization, and Dissemination

It is essential that the proposed Center be given both broad latitude and a well-defined process for determining research priorities among topics such as those listed above. A small core staff of highly qualified individuals in such fields as economics, political science, and management--and with expertise in areas such as educational finance, state policy implementation, the sociology of work, and organizational processes--is envisioned. This core staff should work closely with a strong Advisory Board composed of both researchers and practitioners to select related sets of projects for which associated adjunct staff would be recruited for the duration of particular studies.

This Center would place a significant emphasis on the participation of practitioners in its work, and to that end we recommend that it include a sabbatical program for trustees, administrators, legislators and others who hold leadership roles in postsecondary institutions. Through such a program, we believe, the Center may also indirectly assist in the strengthening of the governance system through the continuing education of leadership.

The sabbatical program is a mode of dissemination in itself; but it is particularly necessary for this Center to engage in a comprehensive dissemination program, particularly as there are currently no locations in the nation at which comprehensive repositories of research and information on governance and finance issues are maintained. Each set of actors must now turn to a different source of information; and no two

sources are alike. The Center would seek to correct this situation by involving national organizations in the dissemination effort, using their regular newsletters and publications, as well as their regional and national conferences. Where appropriate, too, the Center could convene its own specialized conferences in order to ensure that particular audiences (e.g. state legislators, college trustees, directors of corporate education programs) for the Center's research program both received and responded to the results of research.

The scope, organization and dissemination activities of this Center suggest that an annual budget of approximately $750,000 would be required.

CENTER ON

THE RESEARCH ENTERPRISE IN HIGHER EDUCATION

Research, both scientific and scholarly, is one of the central functions of American higher education. While the bulk of this research and scholarship is carried out in approximately 100 of the over 3,000 colleges and universities in the country, its effects are pervasive.

o The importance of this research for national security, health, welfare, and the economy in widely recognized. Not as widely recognized is that some research is done in all institutions of higher education and that this research is disproportionately important in affecting the climate of learning where it occurs.

o The products of research--new knowledge and perspectives--continually modify and shape the content of the disciplines that are taught in institutions of higher education.

o Most faculty in American colleges and universities hold a higher degree and have been exposed to the research enterprise in some way. They bring a perspective based on their experience with research to the way that they teach their subjects.

While the research enterprise centered in our colleges and universities is very large and its importance for the society as a whole is widely recognized, there is much about that enterprise that we do not know. Our ignorance affects the quality of the research effort itself.

A center devoted to the study of the research enterprise in American higher education will want to address the following broad areas.

I. Research and Education in Colleges and Universities

American higher education, unlike the systems in most other advanced societies, has always believed that research and teaching should be closely linked. In this way, teaching in postsecondary education is

continually informed and renewed by the products of research and scholarship.

This link of teaching and research in American higher education is largely a matter of cultural conviction and traditional practice. But this relationship, upon which so much of the excellence of our institutions depends, should be studied in ways that would enable our colleges and universities to strengthen it. For example:

1. Some colleges and universities have recognized the value of research experience for undergraduates. Through such experience, undergraduates learn very early both the provisional nature of what is learned and taught, and the truth that science and scholarship are organized ways of extending knowledge oriented more to what is not known than to applications of knowledge already acquired. A difficulty in bringing undergraduates directly into research, it is often argued, is that they simply do not know enough to be able to take part in research and thus to be brought to the frontiers of knowledge. Some colleges and universities have rejected that assumption by creating research seminars for undergraduates and even for freshman. Such seminars are a common feature of undergraduate honors programs in colleges of all kinds. We should learn more about the extent and success of these efforts, and about other ways in which research can be brought into the education of undergraduates.

2. Research and scholarship is conducted by faculty in the four-year colleges. This research, even though it may not always be of the same kind or done at the same rate as in the research universities, plays a central role in shaping the climates of teaching and learning in the four-year colleges. Moreover, the faculty of these four-year colleges, whether or not they are conducting research, participate in the regional disciplinary associations and their meetings and conventions. A center could shed light on these important but largely neglected activities of faculty in four-year colleges to develop ways of ensuring the

continued presence of research and scholarship throughout the academic community.

3. Graduate education and university-based research are closely linked. The Ph.D., the dominant graduate degree, is a research degree. Yet for many doctoral students their doctoral dissertation is their first and last research experience. We do not know if doctoral education is driven more by the needs of training for a research career, but rather by the needs of departments in research universities for students and research assistants, and by the graduate students own needs for employment as research assistants.

4. The terminal masters' degree has long been source of uncertainty and confusion in non-professional academic disciplines. Efforts to resolve those confusions are handicapped by our ignorance regarding the function of the degree and the career lines of those who are in them. What is the nature and function of the masters' degree in different fields and disciplines? What are the actual careers of those who earn masters' degrees in non-professional fields? What proportion of them go onto a career into or near research and what should be the role of research in the training of masters' candidates?

5. It is widely recognized that scholarly research in the humanities differs in significant ways from research in the natural and physical sciences. For example, research in the humanities is done almost wholly in colleges and universities. As a result, the job market for Ph.D.s in the humanities has been primarily in those same colleges and universities. The large humanities departments in PhD-granting universities that were built up during the period of rapid growth after World War II still are producing more Ph.D.s than the academic market itself can absorb. What policies should be pursued regarding the size of departments and graduate enrollments in the humanities? Are there alternative careers outside of the academic institutions for the Ph.D. in history, English, or modern languages. Should the character of graduate

education in those fields be changed to better prepare students for such careers? What is the connection, if any, between the size of graduate enrollments and the quality of people recruited to scholarship in those traditional fields of study? These are all questions of the greatest importance for the leadership of doctoral granting universities and yet beyond the scope of any one of them to study adequately.

6. What is the role of research in professional education? We know that in most professional schools that there are tensions between professional practice and the basic research that adds to knowledge in the professional field. How does this tension vary in different professions and institutions, and how is it resolved?

7. We have said that ultimately the undergraduate curriculum depends on research and scholarship. But how does that research actually get into the curriculum? What are the time lags in different fields, and what are the effects of the new technologies of instruction on the speed and effectiveness with which new knowledge is brought into the undergraduate curriculum?

II. Problems in the Organization and Finance of Research

Many billions of dollars are spent each year on research carried on in institutions of postsecondary education. Some of the problems have been studied with some degree of care and continuity--for example, the effects of federal science policy on the natural science disciplines and their directions of growth. Much less is known about the effects of science policy, both federal and state, on the institutions in which the research is done. Here are but a few of the many questions for research.

1. What are the effects of federal science policy on the universities' own research centers? In what ways are those centers shaped by policies in the federal government regarding the award of grants or contracts as alternative modes of funding? What are the

differences between peer review and professional staff decisions in the support of university-based research?

2. On the issue of research and accountability, what are the regulatory effects of federal research policy? Have regulation A-21 and similar efforts to monitor the time and effort of research personnel affected the teaching function of university faculty?

3. What do we know about the role of leadership in research? Should research entrepreneurs be leading research people; what should be the division of labor between the intellectual and entrepreneurial roles in developing research? When are academic administrators, such as deans and provosts, pivotal in the leadership and stimulation of research? How do the leaders of scientific communities emerge and what role do they have in shaping the directions of research in their communities?

4. Studies of the size and sources of support for research in the disciplines and sub-disciplines are scattered and incomplete. Little is known systematically across the academic disciplines and over time. How vulnerable are universities to funding agencies and how is their own support for research affected by federal patterns of support? What are the emerging patterns of industry support for university-based research? What are the problems and possibilities in the in joint participation of industrial with academic researchers?

5. Universities are not the only environments of basic research: it is also carried out in industry, government, and non-profit research centers. What do we know about the division of labor in "basic" as compared to "applied" research and what is the role of university-based research in relation to these other research environments and to their non-research functions?

6. To characterize successful research units in universities is perhaps the fundamental question that can be asked. Are there

distinctive patterns of hierarchy or colleagueship in successful research teams and how does this differ by discipline? And can we identify organizational factors that inhibit interdisciplinary research?

7. What is the quality of the research facilities in different kinds of institutions--the laboratories and libraries on which scholars and scientists depend. How do these facilities affect the quality and character of research in different disciplines and in different kinds of institutions? For example, the cooperative use of libraries completely changes the research environment of humanists and social scientists, while molecular biology requires increasingly expensive research facilities. What are the implications of this for public policy regarding support for research facilities?

8. What are the varying patterns of funding of research in the several states, and do we see state agencies pressing public colleges and universities for particular lines of applied research? Or put differently, what research services do higher education provide for state or local government, and how does this affect the balance of activities on the campus? State government provides a very large amount of money in the aggregate for college and university research, but very little is known about how that support affects the research enterprise, the institutions in which the research is carried out, appropriate faculty workloads, or the effectiveness of state government itself.

9. However strong the United States is in its research enterprise, we cannot afford to be the best in every area, and we depend upon cooperation and competition across national boundaries. It would be helpful in developing our own research strategies to know more about the international division of labor in science and scholarship.

III. Research Personnel: Recruitment, Training, Careers, Productivity, and Ethical Issues

The quality of the research done in colleges and universities ultimately depends on the quality of research staffs, whether they are members of the teaching faculties of universities or the non-faculty research staff. Related issues concerning the initial training of researchers have already been mentioned. The general problem is maintaining the quality of the research staffs of colleges and universities throughout there careers.

1. Non-faculty research staff and post-doctoral students are central to the enterprise although their roles are not well understood. What is their motivation? What are and should be their career lines? What are their relations with the regular faculty in their institutions. These question will, of course, vary by discipline and institution.

2. A major question is the aging of the academic profession and its affect on the productivity of the research community. To what extent does the productivity of a discipline depend on a balance among all the cohorts of researchers, with different groups playing different roles in the research enterprise? What alternative career lines exist for scholars and scientists who are no longer at the forefront of their own research fields? How can we find new blood and support young researchers when there are very low rates of turnover in the academic profession itself? Universities here and abroad have had to face these problems; systematic investigation of the alternative responses to these problems would be of the greatest value to the leaders of research communities and of research universities.

3. The growing importance of research supported by industry and government has created a new set of problems centering around potential conflicts of interest as between the funding agency and

the research community itself. These are particularly acute when commercial firms begin to make substantial contributions to university research efforts, as in the bio-engineering fields. This important problem needs a continuing research effort and not merely the sporadic discussions that it is now getting. Moreover, there are other ethical issues in research--for example, problems of secrecy in connection with national security and industrial priority. These issues deserve attention not just by those concerned with ethical issues but by those who are most deeply knowledgeable about the research enterprise itself.

IV. Characteristics of the Center: Scope and Organization

A center devoted to illuminating the nature and problems of the research community must involve the active members of that community in its work. These people cannot be expected to give up their research careers to join the staff of the center on a "permanent" basis; but some may be able to join its work on specific research projects for limited periods. To make this possible, the permanent core staff of the center should be small, and could include perhaps three or four people--an economist, a sociologist, a political scientist--some of whom might be associated with the center on a half-time basis. These, together with support staff, including a person with special responsibility for the dissemination of the work of the center, would require about a third of a total budget of roughly $500,000. Roughly another one-third would be used for the support of visiting research associates, and the balance for dissemination, facilities, supplies, and overhead.

Center for Research on Postsecondary Education Facilities

The ivy-covered walls of the academy are crumbling. About this there is no doubt. There is a growing consensus among both public and private administrators that physical plant degeneration, coupled with demands for new educational facilities, has become the number one problem in campus administration. The very viability of many smaller institutions is delicately poised on their ability to solve capital outlay and deferred maintenance problems. A quarter of higher education's space was built prior to 1950; another 25 percent was constructed in the next 15 years. Just as over 50 percent of our bridges in the United States were built more than 50 years ago, and were constructed with a life expectancy of 50 years, so too our academic buildings have run into terminal disrepair. When bridges were built in the 1930's, there was no way to anticipate burgeoning use of the automobile and extraordinary needs for transportation of goods. When our academic buildings were constructed more than 30 years ago, there was no way to anticipate the social and technological changes which now require spaces of different dimensions and equipages for evolved uses.

The scale of the problem is awesome in terms of square feet alone. All the space occupied by university and college buildings prior to 1950 doubled by 1965, and doubled again by 1981 to research the current estimate of 2.3 billion square feet. The explosion of construction in the 1960's and 1970's accompanied by federal funding and maintenance support has fizzled in the 1980's. Seldom are buildings constructed with a maintenance endowment connected with them. To complicate

matters further, the space possessed by the public sector is four times greater than in the private sector. Fundraising is a familiar activity among independent institutions. They have flexibility to shift focus, developing funding capital for renewal and replacement. Public institutions traditionally have to work through state legislatures, and traditionally have not been successful at seeking support from private enterprise. The combination of social forces, rapid technological change, and benign neglect have contributed to the now serious problem in the physical plants of postsecondary education institutions in the United States.

Repair and renovation of worn-out or outmoded buildings is an unglamorous project, one which foundations and private donors ignore. Federal programs which financed initial construction and purchased equipment have been largely eliminated in the past few years. The 1967 funding level of $1.1 billion fell to $144 million by 1978, a drop of 87 percent without taking inflation into account. State governments have demonstrated similar patterns in facility support. Less than 50 percent of the states have public authorities through which independent higher education institutions may issue tax-exempt bonds. The only bright spot in recent years is a modest increase in private giving. This has not been sufficient for many small private colleges which are largely tuition-dependent. They have been unable to maintain and replace physical facilities in a timely fashion, and we read of their demise in the various news media.

Accurate and comprehensive information on the present situation is limited. The last national survey was compiled by the National Center for

Education Statistics in 1974. A followup 1981 report has only limited information on the value of land, buildings, and equipment and pays no attention to new patterns of commercial development, shared facilities, and the inclusion of the campus in new research and industrial parks. Clearly, much more than accurate information is required. What is in fact needed is a fundamentally new strategy for facilities development in higher education--one that imaginatively combines the insights and specialties of academic planning, engineering, architecture, economics, construction finance, and real estate development.

We require answers to questions we ordinarily forget to ask.

- How can we better link academic planning and facility development to take better advantage of the new educational technologies?
- What are the current patterns of facility utilization, including shared facilities, and what should they be in the future?
- Can we develop new means of financing new construction along with maintenance and rehabilitation?
- What can we learn from new developments in architecture and engineering to make current facilities more efficient and new facilities more flexible in their use and design?
- How can campuses develop rational real estate policies defining these functions, commercial and service as well as educational, that should (and should not) be included and reasonable rules for assigning costs to a campus' space?

To answer such questions, we envision a center within which new research skills and techniques are developed, bringing together the perspicacity of the planner, experienced facility managers, the economist and financier, demographer and sociologist, engineer, architect, and real estate developer.

The research matrix we enclose outlines the five major areas of investigation we have recommended subdivided into three broad timeframes:

- The Campus Today
- The Campus Through the 1980's
- The Campus of the 21st Century

The first column of the matrix defines the problem. Columns 2 through 6 are devoted to the relevant research perspectives. The cells of the matrix define, again in broad terms, the basic research or study topic; for example, a study of the current effects of the physical environment on learning patterns and academic practices (row I, column 2); or the impact changing demographics may have on the utilization of academic facilities in the year 2000 (row III, column 3); or again, developing building standards which better define a useful academic building's half-life--should labs be less permanent than libraries? (row III, column 5).

The consumers of the Centers' research and studies would be both campus administrators and public officials charged with developing capital plans and budgets. What we seek is not the futurologist's vision of the campus of the 21st century, but a center which encourages the collaboration, even collision of practical problemsolvers, facility managers, and teams of experts drawn from such seemingly diverse fields as finance, engineering, cost accounting, and real estate development, along with imaginative academics concerned with the physical constraints of today's campuses.

To some extent, a similar mix of managers and experts has addressed the problems associated with hospital construction and rehabilitation. Here, the cost justifying demands of the new Health Service Agencies (HSA's) have forced new approaches to financing, to construction efficiencies, and to the translation of changing hospital functions into new design and engineering standards. Corporate physical planning has also melded these interests, although in this domain, the role of tax incentives and anticipated changes in the business climate play a different role than they do in higher education.

The immediacy of our problems with the physical plants of our campuses has prevented adequate planning for future student demands and the changing needs of college curricula. Thus, there is a sense of urgency attached to implementing a nationwide focus on our disintegrating campus facilities. Expertise exists in a variety of disciplines to develop solutions to this crisis. Let us begin this important task.

		1	2.	3	4	5	6
		Definition of the Problem	Links Between Academic Planning and Facilities Development	Patterns of Facilities Utilitization	New Methods of Financing	Impact of New Developments in Engineering and Architecture	Rational Real Estate Policies for Campus Development
I	THE CAMPUS TODAY	deferred maintenance, arrested development, poor policies for definition of use	effect of physical environment on educational practice	assessment of current practices	sources of funds plus cost of maintenance	maintenance schedules	current patterns, costs, return on investment
II	THE CAMPUS THROUGH THE 1980's	rehabilitation and down sizing the campus	academic priorities for rehabilitation	develop minimum standards of utilization	cost/benefits of rehabilitation	changes to insure greater efficiency, e.g., energy	strategies for better managing these facilities
III	THE CAMPUS OF THE 21st CENTURY	scale and scope in terms of expected population and public roles	process for translating emerging academic programs into new physical configurations; alternative locales for learning.	impact of demographics on facility utilization in the future	new mechanisms for campus finance	develop new standards, e.g., define half-life of educational buildings by function	strategies for improved real estate development