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FOURTH REPORT

*Returning to  
Our Roots*



**A LEARNING SOCIETY**





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*An Open Letter to the Presidents and Chancellors  
of State Universities and Land-Grant Colleges*



# Returning to Our Roots

## A LEARNING SOCIETY

*T*he United States has many promises to keep. Among the most important is that all Americans, by virtue of effort, industry, and the quality of their performance, are entitled to the fruits of success, to reach as high as their hopes inspire them, and to travel as far as their aspirations lead them.

KELLOGG COMMISSION ON THE  
FUTURE OF STATE AND LAND-GRANT UNIVERSITIES

SEPTEMBER 1999

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## EXECUTIVE SUMMARY

WE WRITE AS twenty-four presidents and chancellors of public state universities and land-grant institutions to make the case that our institutions must play an essential role in making lifelong learning a reality in the United States. The concept of lifelong learning has been talked of before, but, for the first time, we now have the technological means to make it a reality. We are convinced that public research universities must be leaders in a new era of not simply increased demand for education, but rather of a change so fundamental and far-reaching that the establishment of a true “learning society” lies within our grasp.

As leaders of America’s public universities, our challenge in our emerging Information Age is two-fold. First, we must ensure that the remarkable growth in demand for education throughout the lifetime of virtually every citizen can be satisfied; second, we must demonstrate that we can meet this need at the highest level of quality imaginable, along with the greatest efficiency possible.

When this Commission speaks of a “learning society,” it attempts to define something quite new. Among the key elements of a learning society:

- It values and fosters habits of lifelong learning and ensures that there are responsive and flexible learning programs and learning networks available to address all students’ needs.
- It is socially inclusive and ensures that all of its members are part of its learning communities.

- It recognizes the importance of early-childhood development as part of lifelong learning and develops organized ways of enhancing the development of all children.
- It views information technologies, including new interactive, multimedia technologies, as tools for enriching learning by tailoring instruction to societal, organizational, and individual needs.
- It stimulates the creation of new knowledge through research and other means of discovery and uses that knowledge for the benefit of society.
- It values regional and global interconnections and cultural links.
- Finally, it fosters public policy that ensures equity of access to learning, information, and information technologies and recognizes that investments in learning contribute to overall competitiveness and the economic and social well-being of the nation.

### Public Understanding of the Need

To the demands of a changing workforce for opportunities to continue their education and the pressures produced by an accelerated pace of technological change must be added the increasing demands for professional continuing education, which are driven

both by ambitious, conscientious professionals and by state mandates. Results from the 1995 National Household Education Survey (NHES) reveal that nearly half of the adult population 16 and older participates in some form of continuing education annually. So it is not surprising that more than 90 percent of companies surveyed by NHES about their benefits rank continuing education just below health insurance as a desirable way to attract employees. Businesses are of necessity becoming learning organizations in this global market, driven by rapid technological change.

To further clarify the 1995 survey results, the Kellogg Commission asked the Eagleton Institute of Politics at Rutgers University to conduct a Lifelong Learning Survey among selected leaders in several fields. Coincidentally, the Education Commission of the States (ECS) was also polling state governors, state higher education officers, legislators, and others on their perceptions of changes needed in public postsecondary education systems to respond to state needs in the new century. This parallel survey is an excellent supplement to the Eagleton Institute's results, particularly in regard to governors' opinions.

ECS asked governors to consider the critical challenges that face their states and to indicate how important current postsecondary programs will be in helping their states meet those challenges. The vast majority of respondents (32 of 35) rated linkages to K–12 and teacher education as the most important postsecondary function; development of job training and employment skills ranked second (30); and applied research for community

and economic development was third (29). The top preference of the governors was to use technology to deliver more educational offerings. Ninety-four percent were supportive or very supportive of this strategy.

The Rutgers Eagleton Institute's survey provides information more specific to state and land-grant institutions. It also adds some interesting insights on the reasons the respondents believe lifelong learning to be important, as well as the strength of their opinions and the breadth of the strategies they believe ought to be used to advance lifelong learning as a national priority. The major objectives of the survey were to elicit opinions of more than 435 decision makers in K–12 and higher education on the importance and benefits of lifelong learning and on the obstacles facing public research universities in supporting lifelong learning. The overall response rate was 38 percent.

Practically unanimously the respondents strongly agreed that lifelong learning "promotes individual well-being" (99 percent), "benefits corporate productivity" (99 percent), "is important to the country's economic prosperity" (99 percent), and "enhances the quality of community life" (98 percent). More than eight in 10 also agreed that lifelong learning "is important to the security of the nation" (87 percent), "is a national priority" (85 percent), and "promotes family preservation" (85 percent). Nearly all respondents (94 percent) felt that public universities were suitable places for lifelong learning programs.

We are asked to broaden our understanding of our mandate for access and equal opportunity so that we equip

Americans for a lifetime of learning in a learning society. This requires that we realistically assess the educational, social, cultural, and economic challenges that line the path ahead. If we are to create such a society, we need to do so while thinking about three different sets of issues. The first set is found in the larger environment in which we pursue our mission, as we respond to the ideals of access and equality, pervasive rapid change, and the disorienting effects of internationalization. The second is largely educational, a set of learning problems and issues inside and outside the academy that neither policymakers nor educators have fully resolved. The third set relates to the capacity of public research universities to meet the new demands for an environment that supports continuous learning and distance education.

We must renew our commitment to making conscious connections between knowledge and action, and between theory and practice as we formulate research priorities in support of a learning society. We need to increase our research activity in all of the areas that contribute to the creation, retrieval, delivery, and preservation of knowledge of value to that society. In addition, it will be important to understand the pedagogies that are most effective in encouraging the application of critical thinking, problem-solving, and analytical skills in a technologically sophisticated environment, one rich in information resources.

**To advance the legacy we have inherited and to move forward toward the creation of a true Learning Society, we offer three recommendations:**

## RECOMMENDATIONS

### I. Make Lifelong Learning a Part of Our Core Public Mission

**WE RECOMMEND** *that state and land-grant universities reaffirm their public character and public mission by making lifelong learning part of their core mission.*

Several actions will contribute to this goal:

- **Access.** We must broaden access to lifelong learning by providing a wide variety of teaching and learning opportunities and approaches, ranging from traditional on-campus instruction to Internet-based courses.
- **Partnerships.** Partnerships of three kinds are essential. First, for the broadest, most convenient and effective use of our resources, we need to form partnerships with other institutions, especially community colleges, to provide high-quality academic programs and services to students in cost-efficient and accessible ways. Second, partnerships between the higher-education community and pre-kindergarten through 12th grade education are essential to prepare young people, not only to succeed in college, but also to learn throughout their lives. Third, we need to expand and improve partnerships with government, business, and professional associations to plan in advance for the educational needs of the workforce, so as to meet those needs on a timely basis through on-campus classroom instruction,

on-site instruction in workplaces, and distance learning.

- **Mission Differentiation.** We must encourage state systems of public higher education to differentiate institutional missions in higher education so that resources are used in the most effective and efficient ways possible, from specific job-skills training to ongoing education not linked to specific occupational skills.
- **Accreditation.** To ensure quality in lifelong learning, we must engage accrediting associations, both regional and professional, in discussion of appropriate standards for lifelong learning and appropriate expectations for institutions in programs they offer through distance education.

## II. Create New Kinds of Learning Environments

**WE RECOMMEND** *that each institution aim to equip its students with the higher-order reasoning skills they require for lifelong learning, while providing faculty members with opportunities and incentives for professional development so that they can acquire the pedagogical skills needed to create active learning environments.*

Again, several actions are needed to reach this goal:

- **Higher-Order Reasoning Abilities.** Learners must develop complex skills such as critical thinking, problem-solving techniques, and the use of abstraction and analysis.
- **Upgrading Skills.** Because people will have to be able to renew their professional skills or change their career directions several times during their working lives, they will need easy access to the programs and institutions that will allow them to do so.
- **Faculty Development.** Faculty must be provided with opportunities to learn to use active-learning pedagogies and to enhance their use of information technology as a tool in teaching and learning.
- **Research on Learning.** To provide the best possible basis for our efforts, we need to encourage research on the learning process itself, with the goal of creating a science and a methodology to discover how we can most effectively present knowledge to the human senses. Teachers and learners will need to assimilate, evaluate, generalize, and apply such knowledge.
- **Technology in Teaching.** The new learning science must address techniques for interaction, collaboration, and communication using computer systems. Such systems provide information and offer asynchronous communication, as well as opportunities for collaboration and interactive manipulation as part of the learning process.

### III. Provide Public Support for Lifelong Learning

**WE RECOMMEND** *that state and federal governments acknowledge the significance of lifelong learning by taking the necessary steps to meet the public need for it.*

For example:

- **Public investment.** To further develop the intellectual capital that is the foundation of our economy in the Information Age, public investment in systems of higher education must increase to keep tuition affordable for all students, including continuing-education students and those who study through distance education.
- **Research.** Competitive, peer-reviewed grants for research in effective learning methodologies, including methods used in distance learning and technology-based learning, must be offered.
- **Infrastructure Support.** Funds are needed for public institutions' capital and operating expenses for information technology. Building our high-tech infrastructure is a task just as large and important as

the construction of our railways in the 19th century or our national highway system in the 20th century.

- **New Aid Policies.** Federal and state financial-aid policies must be revised to better meet the needs of lifelong learners.

A new century brings with it new uncertainties. The American people and their educational leaders face many challenges, but they can look to the future with confidence if they create an environment with many opportunities for a lifetime of learning, that is, a Learning Society. One thing is clear: Our society, its leaders, and its people must take up this challenge. The United States has many promises to keep. Among the most important is that all Americans, by virtue of effort, industry, and the quality of their performance, are entitled to the fruits of success, to reach as high as their hopes inspire them, and to travel as far as their aspirations lead them. If this society is to make good on that promise, no issue is of more profound significance than the quality of the learning opportunities provided across America.





## PREFACE

CONVINCED THAT THE United States and its state and land-grant institutions were facing major changes, in 1995 the National Association of State Universities and Land-Grant Colleges (NASULGC) sought the support of the W. K. Kellogg Foundation for an effort to examine the future of public higher education.

The Foundation, already supporting several major institutional-change initiatives, responded to this request promptly and generously. It agreed to support a multi-year national commission to rethink the role of public higher education in the United States and to lend its name to the effort. The first meeting of the Kellogg Commission on the Future of State and Land-Grant Universities was held in January 1996. Since that meeting, the Commission has issued three reports in the form of open letters: *Returning to Our Roots: the Student Experience*; *Returning to Our Roots: Student Access*; and *Returning to Our Roots: the Engaged Institution*.

This latest open letter, *Returning to Our Roots: A Learning Society*, addresses the role of the public university in a society that increasingly recognizes the need for perpetual learning throughout life. It addresses the broader issues of a Learning Society, including the importance of research to the creation of knowledge beneficial to society, universities' role in the creation and dissemination of that knowledge, and the importance of continuous education to society.

Between now and the end of the first quarter of 2000, we plan to issue two more open letters, one on the campus culture and a final report anticipating the possible challenges, importance, and nature of American public higher education in a new century.

We thank our colleagues on the Commission for their commitment to this assignment and the many thoughtful ways in which they shaped this document. Although each of the members of our Commission might individually have written a slightly different document, all are unanimous in supporting the broad themes and directions outlined here.

GRAHAM SPANIER (Chairman)  
President  
The Pennsylvania State University

DOLORES R. SPIKES (Vice-Chair)  
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JOHN V. BYRNE (Executive Director)  
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C. PETER MAGRATH  
President  
NASULGC



# Broad Support for a Learning Society



WE WRITE AS twenty-four presidents and chancellors of state universities and land-grant institutions to make the case that our institutions must play an essential role in making lifelong learning a reality in the United States. The concept of lifelong learning has been talked of before, but, for the first time, we now have the technological means to make it a reality. We are convinced that public research universities must be leaders in the years ahead, a new era of not simply increased demand for education but rather of a change so fundamental and far-reaching that the establishment of a true “learning society” lies within our grasp.

It is already a cliché to refer to the 1990s and beyond as the Information Age. The term is not unambiguously positive. A bewildering flood of information threatens to overwhelm our senses and overcome our ability to discriminate, interpret, integrate, and use it. In contrast to this overabundance of information—much of it raw, partial, outdated, or biased—is the relative scarcity of that prized commodity, knowledge. Its importance is acknowledged when management experts refer to corporate employees as “human capital.” It is underlined when CEO’s aver that brain power is the energy driving their technologically sophisticated companies. Knowledge is truly the new capital of our time.

As leaders of America’s public universities, our job in this emerging Information Age is two-fold. First, we must ensure that the remarkable growth in demand for education

throughout the lifetime of virtually every citizen can be satisfied; second, we must demonstrate that we can meet this need at the highest level of quality imaginable, along with the greatest efficiency possible.

## The Learning Society

When this Commission speaks of a “learning society,” it attempts to define something quite new. A true learning society is socially inclusive of all its members, including children, young and older adults, the elderly, the employed and the unemployed, the advantaged and the disadvantaged. For the sake of society, as well as for personal fulfillment, all students must be educated to the highest levels they can reach. Everyone can learn, but not everyone learns in the same way. We must bend every effort to make certain that the learning opportunities we provide meet the needs of potentially successful students with diverse educational preparation, diverse learning styles, and varied goals and interests. We must share with colleagues our research and conclusions on successful strategies for improving student learning in both K–12 and higher education, to ensure that as many students as possible are adequately prepared for a lifetime of learning. Among the key elements of a learning society:

- It values and fosters habits of lifelong learning and ensures that there are responsive and flexible learning programs and learning

## Creating a Public System of Early Childhood Education: Rutgers University

The testimony of Rutgers professor Steve Barnett during the *Abbott v. Burke* school funding case in 1998 influenced a judicial mandate for solid preschool education for poor urban children. An historic New Jersey State Supreme Court ruling directed that, by September 1999, the state must provide well-designed high-quality programs for all 3- and 4-year-old children (as well as all-day kindergarten children) in the 28 school districts represented in the case. Already, 22 of the 28 districts are developing preschool programs with assistance from the Rutgers Center for Early Childhood Education.

Although the court decision required only a half day of preschool, a Rutgers Center for Early Childhood Education study of 2000 kindergarten students found that children in the *Abbott* districts were 18 months behind national norms in communication skills and six months behind in overall academic abilities. The day

after the study was released, Governor Christine Whitman called for full-day, year-round preschool for 3- and 4-year-olds.

Still at issue are the quality and cost of the massive new program. The state plan for preschool education relies heavily on existing community day-care centers which would have one certified child-care worker and two assistants for every 20 children, at a total cost of \$264 million for 33,000 children. Professor Barnett believes that the best possible programs—offering small classes, appropriate curricula, and teachers specializing in early-childhood education—would cost even more, about \$400 million or \$10,000 to \$12,000 per child annually. Yet, he noted in testimony to a state legislative panel, for every \$12,000 the state invested to pay for preschool for one child, the long-term payoff would be \$108,000, counting taxes paid and savings in spending on special education, welfare, and prisons.

networks available to address all students' needs.

- It is socially inclusive and ensures that all of its members are part of its learning communities.
- It recognizes the importance of early-childhood development as part of lifelong learning and develops organized ways of enhancing the development of all children.
- It views information technologies, including new interactive, multi-media technologies, as tools for enriching learning by tailoring instruction to societal, organizational, and individual needs.
- It stimulates the creation of new knowledge through research and other means of discovery and uses that knowledge for the benefit of society.
- It values regional and global interconnections and cultural links.
- Finally, it fosters public policy that ensures equity of access to learning, information, and information technologies and recognizes that investments in learning contribute to overall competitiveness and the economic and social well-being of the nation.

## Taking University Education to the Community: Nebraska, Illinois, and Florida

**Nebraska CorpNet**, launched in 1985, is an onsite corporate training network that has grown to serve more than 25 businesses throughout the state. With the purchase of its own satellite transponder in 1989, the state of Nebraska created a satellite network serving all educational sectors. Downlink sites expanded to include Cooperative Extension sites and Educational Service Units, as well as many high school and the post-secondary institutions.

The convergence of technologies creates opportunities to teach students using a variety of media to complement learning objectives. Delivering video via satellite, ITFS, T1, and computer allows synchronous interaction, while the Internet supports asynchronous communication. Students participate in classes from their work sites, Cooperative Learning Centers, community and state colleges, Cooperative Extension sites, high schools, and from home.

**"Partnership Illinois"** is the gateway to more than 400 hundred programs offered by the University of Illinois at Urbana-Champaign, supporting local and statewide needs of schools, businesses, governmental agencies, non-profits, communities, and citizens. A campus-wide commitment, Partnership Illinois raises visibility and improves access to university resources through partnerships with external organizations. Over the past couple of years, 43 new initiatives have been supported with small seed grants that leveraged more than \$400,000 in outside support. For example, through Community-Wide Networking: Building Equity and Participation, the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign is creating a prototype of how residents of low-income neighborhoods can get onto the information highway from their homes.

Thanks to \$1.3 million in grants to the University of Illinois, the information highway is

being rerouted into several low-income neighborhoods of Urbana and Champaign, not far from the campus of the University of Illinois. The new program is a partnership with the Urban League of Champaign County and Prairienet, a community computer network, and is supported by the U.S. Department of Commerce, the W. K. Kellogg Foundation, and a variety of community agencies. The goal is to bring the Internet into more than 1,000 low-income households in four targeted neighborhoods by making network accounts and computer hardware available to low-income residents, and by training teens to provide training and computer troubleshooting.

**"Bright Futures Tutoring"** is a community partnership between the University of Florida's College of Education, the Gainesville Housing Authority, and the Gainesville Police Department to provide tutoring for youth in Gainesville public housing neighborhoods. Supported by the U.S. Department of Housing and Urban Development, the program enlists all first-semester, elementary-education majors as tutors. Every semester over 100 tutors go to work in and around Gainesville's public-housing neighborhoods to help at-risk youth become more successful in school. Each tutor is assigned to a youth who lives in or near one of six tutoring sites, and they meet twice a week for an hour over a 10-week period.

The students' course work is designed to provide help in meeting the challenges tutoring poses for them. The dilemmas they face become the subject of class discussions. Students feel that it is an excellent introduction to teaching. The Bright Futures program is an important collaborative effort of the community, the schools, and the university. While the tutors are learning about how to be good teachers, the students are showing improvement in their school work and in their confidence.

## Public Understanding of the Need

The factors that make the creation of a learning society imperative are ubiquitous and inescapable, familiar to all of us. We are fortunate that Americans seem prepared to meet the challenges of learning because they understand the need.

Results from the 1995 National Household Education Survey (NHES) reveal that nearly half of the adult population 16 and older participates in some form of continuing education annually. That amounts overall to about 76 million people, of whom 40 million take work-related courses and 38 million take courses for personal enrichment. According to the NHES data, 58 percent of these learners have at least a college degree.

To the continuing-education demands of a changing workforce and the accelerated pace of technological change must be added the increasing demands for professional continuing education, demands driven both by ambitious, conscientious professionals and by state mandates. For example, engineers were not required to take any continuing education in 1976, but 12 states require it now and 14 more have such legislation on their dockets. Continuing education for lawyers, required in only 10 states in 1981, is now mandated in 37. At least 40 states now require continuing education for chiropractors, certified public accountants, dentists, insurance personnel, nursing home administrators, opticians, psychologists, pharmacists, and real estate brokers. Social workers and veterinarians have continuing education requirements in 39 states, physicians in 28, nurses and physical

therapists in 23. In medicine, virtually all specialties require continuing education of physicians, as do requirements for state licensure. Some professional associations offer their own courses, but institutions of higher education offer most of the continuing education in fields such as nursing, engineering, and social work.

Bureau of Labor Statistics reports show that the number of people 55 and older participating in the workforce has increased significantly in just the past 10 years and is expected to balloon as the baby boom generation continues to age into the next century. In 1976, half of U.S. workers were aged 16 to 34; in 2006, 63 percent will be aged 35 to 64. The older labor force will make employee education an even more essential part of the cost of doing business than it is today. The 65-year milestone for retirement has been weakened, if not overturned, by the federal prohibition against age discrimination. As people live longer and are able to maintain better health, they will be interested in updating their skills and keeping pace with their fields in order to extend their careers. Moreover, the age tables of the U.S. workforce are in the process of being weighed far more heavily with older workers.

Given the very large proportion of the population engaged in continuing education, it is not surprising that more than 90 percent of companies surveyed by NHES about their benefits rank continuing education just below health insurance as a desirable way to attract employees. Businesses are of necessity becoming learning organizations in this global market, driven by rapid technological change. Constant

technology upgrades require continuous upgrades in human resources as the key to remaining competitive. Although the percentage of companies' payroll spent on education dropped slightly between 1995 and 1996, the amount spent per employee increased nearly 10 percent, to \$1,526 apiece, with nearly half of corporate education budgets spent on professional and technical skills allowing companies to chalk up gains in productivity.

### **Public Leaders Are Also Convinced**

To understand leaders' opinions, the Kellogg Commission asked the Eagleton Institute of Politics of Rutgers University to conduct a Lifelong Learning Survey among selected leaders in several fields.

Coincidentally, the Education Commission of the States (ECS) was also polling state governors, state higher-education officers, legislators, and others on their perceptions of changes needed in state postsecondary education systems to respond to state needs in the new century. ECS's VOICEPOLL, an automated telephone survey, was administered in February and March of 1998. Thirty-five of 51 governors (including the Commonwealth of Puerto Rico) responded. This parallel survey gives us an excellent way to supplement the Eagleton Institute results, particularly in regard to governors' opinions.

The ECS survey indicates that K–12 education, postsecondary education, and early-childhood development/child care are the governors' top spending priorities, outranking criminal justice, healthcare, welfare reform/social

services, roads/infrastructure, and returning some or all surplus funds to taxpayers. As the ECS points out in its commentary, this contradicts the perception of higher education leaders that governors place a higher priority on roads or tax cuts than on education or human services.

According to governors' perceptions, the postsecondary institutions most responsive to state needs are community and technical colleges, rated responsive or very responsive by 24 of 35 respondents. Public research universities rated second, public four-year colleges third.

The governors were asked to consider the critical challenges that face their states and to indicate how important current postsecondary programs will be in helping their states meet those challenges. The vast majority of respondents (32 of 35) rated linkages to K–12 and teacher education as the most important postsecondary functions; job training and employment skills ranked second (30); and applied research for community and economic development was third (29). Basic research was rated as important or very important by about half the responding governors.

When asked what changes need to take place in higher education to meet the needs of the future, nearly every governor responding (97 percent) said it will be important or very important to encourage lifelong learning in postsecondary education. The next change in order of importance to the governors (83 percent) was to allow students to receive their education anytime, anyplace through technology, and the third (77 percent) was to require collaboration with business and

industry in developing relevant curricula.

Asked to rank their states' priorities in providing access to different levels and types of education, the governors ranked investing more in postsecondary education/career training the highest; expanding access and subsidies for baccalaureate education next; and providing universal access to the first two years of postsecondary education third.

One of the ECS questions was: "If there is a significant increase in the number of people who want to enroll in postsecondary education over the next decade, in your view, which of the following strategies would you support to help your postsecondary institutions cope with the increased access demands?"

The top choice of the governors was to use technology to deliver more educational offerings. Ninety-four percent were supportive or very supportive of this strategy. The next in popularity was to require reallocation from institutional budgets to improve efficiency and provide access (77 percent), and the third was to require more students to attend a community or technical college for their first two years (70 percent). Dead last was the option of raising tuition (14 percent).

A second question probing investment options elicited once again the information that the governors were most supportive of investing in technology to meet increased demands for access to postsecondary education (33 governors or 97 percent). Support for different institutional-quality initiatives was the choice of 28 governors; increasing student scholarships appealed to 25; and 20 said they were supportive of increased operating funds

to support enrollment growth. When asked to consider their state's investment in postsecondary education in relation to other components of state government in the next decade, 90 percent of the governors said that their state investment in higher education would increase.

By its nature and design, the Rutgers Eagleton Institute's survey provides information more specific to state and land-grant institutions. It also adds some interesting insights on the reasons the respondents believe lifelong learning to be important, as well as the strength of their opinions and the breadth of the strategies they believe ought to be used to advance lifelong learning as a national priority.

On March 2, 1998, the survey was mailed to a sample of higher education and political leaders in the United States. More than 435 key individuals associated with public policy in K-12 and higher education were selected. The major objectives of the survey were to elicit opinions of decision makers on the importance and benefits of lifelong learning, the degree to which land-grant institutions are suitable for and successful in implementing lifelong learning, and the obstacles facing such institutions in supporting lifelong learning. The survey was mailed to all 50 state governors, 61 state higher education officers, 53 corporate executives, 50 state departments of higher education, 56 presidents of land-grant institutions, 138 state legislators, and 21 members of the Council on Adult Experiential Learning (CAEL). The overall response rate was 38 percent. Not surprisingly, the highest response rate (71.4 percent) was from presidents of land-grant institutions, but the response rate from

state higher education officers and state departments of education was also 50 percent or better. Respondents belonging to the Council on Adult Experiential Learning had a 33 percent rate of return. Although 15 of 50 governors returned surveys (30 percent), only 25 responses were received from the 138 surveys mailed to state legislators (18.1 percent).

It should be emphasized that, although the survey was worded specifically to ask about land-grant universities, the challenges and obligations of fostering a learning society apply equally to *all* public research universities.

The topic of lifelong learning was at least somewhat familiar to 94 percent of the respondents. Defining lifelong learning as “the process of intellectual and professional renewal that leads to both personal enrichment and occupational growth” was agreeable to 91 percent of those surveyed. Despite the breadth of that definition, a few respondents complained it was too narrow. Among the complaints: The word “renewal” doesn’t describe the continuous creating, acquiring, and applying of knowledge at all ages; the word “personal” overlooks the importance of lifelong learning for “fostering citizenship and community development”; and lifelong learning, one respondent claimed, is “not just the acquisition of new skills, but increasingly an understanding as to how to use skills to solve problems not even yet considered.”

A governor admonished us that lifelong learning is “not just ‘enrichment’ and ‘growth,’ but also survival.” Other respondents added that it is “continuous and expansive, much like an expanding universe;” that it is “also

the pursuit of new learning, i.e., fields of study never before experienced;” that “the societal imperative viz., the learning society should be built into the definition.” In brief, several respondents were inclined to expand and strengthen the definition.

Almost unanimously, the respondents strongly agreed that lifelong learning “promotes individual well-being” (99 percent); “benefits corporate productivity” (99 percent); “is important to the country’s economic prosperity” (99 percent); and “enhances the quality of community life” (98 percent).

More than eight in 10 respondents also agreed that lifelong learning “is important to the security of the nation” (87 percent); “is a national priority” (85 percent); and “promotes family preservation” (85 percent). Accordingly, at least 80 percent of respondents felt it important to advance lifelong learning as a national priority through further commitments of resources, reorganization of the delivery of education and training, steps to ensure equity of access, maximal use of new technologies, and promotion of the link between universal lifelong learning and America’s position in the global economy.

Nearly all respondents (94 percent) felt that land-grant institutions are suitable places for lifelong learning programs. A number of respondents cited and praised the historic mission of land-grant institutions in educational outreach and public service, saying this background was a reason to make lifelong learning part of the land-grant mission.

Several, however, commented that other state institutions might be equally or more suitable, especially

community colleges and urban institutions. A land-grant president wrote thoughtfully of the excellent resources at universities such as his—high-quality faculty and the new cadres of knowledge professionals—but he cautioned that they have to be mobilized to reinvent the land-grant mission. Skeptics cited “higher education’s well-entrenched aversion to change” and cautioned that we are “sometimes large, bureaucratic, and slow as opposed to nimble and adaptive.”

Characteristics of land-grant institutions that at least half of the respondents indicated are “very important” in fostering lifelong learning include: technology-enhanced infrastructure, integration of research with teaching, emphasis on accountability and outcomes, an environment that supports a culture of learning, resources (e.g., libraries, information technology), active outreach/continuous learning programs, and an emphasis on learning outcomes for a diverse group of learners. In short, our public institutions enjoy a lot of support among leaders of many different sectors for being major contributors in the development of a learning society.

However, our success in responding to these expectations will be neither automatic nor assured. Critics point to several institutional impediments to our capacity to move forward with this new agenda. Institutional leaders must understand that we will need to convince the general public and government leaders that we are capable of doing what this new role requires.

Many people surveyed by the Eagleton Institute instrument felt that public universities have not been

completely successful in responding to the need for change. For example, while approximately three-quarters of respondents moderately agreed (at least a three on a five-point scale) that land-grant institutions are generally successful in most areas, there are a few aspects in which improvement is needed. In particular, a considerable percentage of respondents felt that the institutions are not successful (rated at two or less on a five-point scale) in emphasizing accountability (40 percent of respondents), being concerned with the outcomes of learning (42 percent), or in having the pedagogical expertise needed to improve the implementation of lifelong learning (43 percent).

Consequently, the following areas were rated by at least two-thirds of the respondents as definitely an obstacle (a four or five on a five-point scale) to supporting lifelong learning at land-grant institutions:

- Skepticism about faculty members’ expertise in teaching via distance education (76 percent);
- The lack of a consumer-driven orientation to education (76 percent);
- The lack of incentives for faculty to integrate technological innovations into the curriculum (73 percent);
- Limited institutional flexibility to bring about change (73 percent);
- A model of education that emphasizes teaching rather than learning (71 percent);

- The lack of a student-centered orientation to education (71 percent);
- The lack of faculty involved in programs emphasizing lifelong learning (70 percent);
- The lack of professional-development opportunities for faculty to enhance their use of informational technologies for teaching and learning (67 percent);
- The lack of financial support for curricular innovation (67 percent).

Asked to describe anything else that would be an obstacle to land-grant institutions supporting lifelong learning, a governor said that the primary obstacle would be that “state-of-the-art technology is not used in teaching and research.” A university president, noting that technology is expensive, wisely recommended that higher education partner with other sectors to help cover the costs and develop a more effective voice in regulatory and policy discussions concerning technology.

## A Dilemma

As institutional leaders, then, we are faced with something of a dilemma. On one hand, the learning society benefits from broad public and policy support, and our institutions, likewise, can bask in the warm glow of approbation for our past contributions and the expectation that we will contribute in the future. On the other hand, even within our own ranks, some doubt exists that we have the energy to overcome the inertia of institutional habits and preferences in how we go about our work.

In framing a leadership agenda for bringing about the learning society, our task will be to work through this dilemma. The new role before us is no less important than the one we assumed under the original Morrill Act of 1862, or the Hatch Act of 1887, or the 1914 Smith-Lever Act. The first called on us to democratize higher education. The second asked us to focus research on technological advances in agriculture and industry. And the third made public service and engagement guiding principles in our work.

Today we need to respond to a new call. We are asked to broaden our understanding of our mandate for access and equal opportunity so that we equip Americans for a lifetime of learning in a learning society. This requires that we realistically assess the educational, social, cultural, and economic challenges that line the path ahead.





# Challenges

FEWER THAN TWO decades ago, there were projections that American universities would be in the throes of painful contractions during the 1990s, as the demand for their services fell sharply with the decline in numbers of students of college-going age. Like all predictions based on a simple extrapolation of current trends, this one was flawed. The reason is not hard to discern. Demand increased dramatically as more and more new jobs required postsecondary education and the college-attendance rates of women and non-traditional older students increased. Now, some estimates place the number of new jobs calling for education beyond high school at more than three out of four.

Other challenges lie ahead as our society evolves toward becoming a learning society. If we are to create such a society, we need to do so while thinking about three different sets of issues. The first is found in the larger environment in which we pursue our mission. The second is largely educational, a set of learning problems and issues inside and outside the academy that neither policymakers nor educators have fully resolved. The third relates to the capacity of the public research university to rise to the new demands we face.

## External Challenges

Externally, we are beset by new challenges to ideals of access and equality, pressures brought by perva-

sive rapid change, and the disorienting effects of internationalization.

**Equal Access** New waves of immigration have increased the diversity in our institutions. Although we have a long way to go, enrollment at our institutions now more closely reflects the diversity of America's population than it did a generation ago. Demographers predict that, if present trends in immigration continue, by 2050 nearly half of our population will be made up of members of minority groups: 26 percent Latino, 14 percent African American, and 8 percent Asian American. Most of our institutions have been aggressive and successful in admitting increasing numbers of minority-group students, but, as the Kellogg Commission report on student access pointed out, to reflect American demography accurately we would need massive improvement. The growth of an anti-affirmative-action climate in our country means that we are challenged to accomplish the needed improvements for access in a much more difficult context.

Meanwhile, there is a great deal of well-justified concern over the growing gap between the rich and the poor in this wealthy society. In our high-technology service economy, good jobs with high wages for unskilled workers are vanishing remnants of the industrial era. The public clearly understands the fact that the only door to opportunity in the future is education. On average, a college graduate earns 73

percent more than a high school graduate. A master's degree recipient earns 30 percent more than a bachelor's degree holder. With a professional degree, earnings soar to 230 percent above the bachelor's degree level and are roughly four times what the average high school graduate earns.

The hidden good news is that the gap between rich and poor citizens has forced us to focus with renewed vigor on the underlying issue of better preparation for our prospective students in their K–12 schooling. Most of us have been helping our school systems for years, and many public universities have developed partnerships with schools in economically distressed urban areas. Our limited success, though, indicates that greater efforts are needed.

**Rapid Change**The pace of change has accelerated in our society so that not only our work, but also our entire environment is being rapidly transformed by the seemingly infinite possibilities of information and communications technologies. Thus, while continuous learning is certainly crucial for the new working environment (where domestic and international competition forces business to reduce costs, focus on quality, constantly introduce leading-edge technologies, and demand multi-skilled, flexible workers), lifelong learning skills are equally necessary for a full, informed life and responsible citizenship in our technologically based and globally connected environment.

The information explosion threatens to drown us in an indiscriminate flood

of unsorted information. That onslaught itself has made even more relevant the higher learning skills that colleges and universities teach: critical thinking, analysis, reasoning and problem-solving, as well as an understanding of the methods of inquiry and testing used to discover and validate new knowledge. The ability to acquire, understand, and organize pertinent, accurate, authoritative information provides the essential context for technical know-how, the skill in navigating through complex cyber-systems of information.

**Internationalization**Not only the pace but the nature of change—the internationalization of American life—demands the creation of a learning society. Here too, on the cusp of change, the United States is uniquely challenged and advantaged. Following the last national census, demographers reflecting on the growing cultural diversity of his nation of immigrants, asserted that in the United States we are witnessing the birth of the first truly global society. Our experience in dealing with our own internal diversity and the challenges it represents has forced our entire educational system out of its traditional mono-cultural assumptions. We are already striving to understand and communicate across cultural and linguistic borders within our own increasingly multi-cultural nation.

As national borders become more permeable and transparent to huge international networks of mass communication and transportation, we confront again on a worldwide scale the need for cross-cultural understand-

ing. We are all now citizens of the world. That citizenship requires continuous education, particularly for Americans, who are at once both the most isolated and the most interconnected of people.

Historically, we have been isolated by geography and a mono-linguistic tradition. At the same time, we are connected to the world by our economic strength, the pervasive spread of American popular culture, and the use of English as the *lingua franca* of commerce, the Internet, and much international scientific exchange.

When we deal with the relevance of lifelong learning to our globalized society, we do not mean simply our need to master the technical complexities of instantaneous communication, worldwide commerce, and interna-

tional economics. We must also keep at the forefront of our agenda the basic requirement that we continue to recognize differences and learn to understand, respect, and communicate across them. From this perspective, a great deal must be required of U.S. higher education in providing our citizens with continuing education about the challenges we face us globally in fostering cross-cultural exchange and understanding.

### **Educational Dilemmas**

Along with these challenges in the larger social environment we find at least two longstanding educational dilemmas. The first is the need for a better understanding of the processes of learning and cognition. The second

## **The Global Graduates Program in Oregon**

The Oregon International Internship Program, also known as Global Graduates, gives Oregon university students hands-on international work experience and strengthens the global competitiveness of the state's labor force. Since Global Graduates began in 1996, the program has sent more than 430 students abroad for international work experiences at over 150 sites in more than 59 countries. Global Graduates also provides scholarships to students to support their international internships. To date, \$1.2 million in scholarships have been awarded, and the program has leveraged nearly \$400,000 in financial

support from internship sites in Oregon and around the world.

Housed at Oregon State University, the Global Graduates program provides internship opportunities to students attending all seven Oregon public universities. Internships provide a wide variety of work experiences with businesses, industry associations, environmental organizations, hospitals and social service organizations, veterinary clinics, police departments and law offices, newspaper and magazine publishers, schools, theaters, political parties, museums, banks and government offices.

## Cyber Education

### **A Virtual Classroom at Washington State University**

The first day of a recent Washington State University macroeconomics course was taught traditionally, in a campus classroom, by a professor in the College of Business and Economics. After that first meeting, the 70 students took the rest of the prototype course completely online over the World Wide Web, thanks in part to a grant from a foundation supporting virtual-education projects, created by WSU alumnus Paul Allen, a co-founder of Microsoft.

From their home or campus computers, students were able to: read along with an online narrator; watch flash animations, moving text, graphs, and on-screen illustrations; manipulate interactive exercises; and complete self-tests at the end of each learning module. The students belonged to online "chat groups" to discuss the materials and had online office hours with the professor.

For some students the virtual class has two major advantages over the traditional class. First, the virtual class is available 24 hours a day to accommodate students who have time constraints that prevent them from attending traditionally scheduled lectures. Second, the computer can facilitate interaction with the subject matter in ways not possible using traditional methods. A traditional textbook in economics has many static diagrams, but the online materials used in this class can be manipulated by the students, and the diagrams become interactive. World Wide Web-based instruction is expected to enhance the effectiveness of education and teachers, helping reach students with diverse learning styles.

### **A Virtual Chemistry Laboratory at the University of Alabama-Birmingham**

As part of the efforts to renovate its facility for undergraduate chemistry instruction, the University of Alabama at Birmingham is developing plans for a virtual laboratory learning environment. These facilities will use the latest electronic communication technology as part of flexible learning formats that focus on an active, learner-centered approach to instruction. Advanced technology applications, hands-on experimentation,

teamwork, simulation, modeling, cheminformatics and productivity tools will be incorporated as part of new teaching methodologies that will also encourage the development of critical thinking and communication skills.

The planned facilities will allow course and laboratory instruction to be integrated in a common area. The emphasis on lectures will be replaced with a brief introduction to the class topic, followed by a variety of activities that make extensive use of technological resources to augment laboratory training and immediately reinforce new concepts. Included in the facility will be a state-of-the-art interactive learning center and multimedia technology unit, group learning stations, computer/multimedia sites, voice/data outlets, electronic links to instrumentation, and instrumentation stations. Four student workstations for wet laboratory work will include computers that will make it possible for students to gain experience using "what if" scenarios, examine simulated data, and learn about and gain experience in computer-based, laboratory-information management.

### **Introductory Chemistry at the University of Wisconsin-Madison**

At the University of Wisconsin-Madison, two introductory chemistry courses, in which a total of 4,400 students enroll each year, are being reconfigured to include more individualized learning opportunities for students and fewer lecture and discussion hours. The initial ideas and developments were seeded by a grant from the National Science foundation program called "Establishing New Traditions: Revitalizing the Chemistry Curriculum," which included a coalition of four-year colleges, universities, and two-year colleges. A major challenge in introductory chemistry is working with students coming from a variety of backgrounds. Some have a strong pre-college experience from excellent high schools; others have inadequate chemistry background; some enter with no background. At present, it is difficult to deal with this broad range of student preparation because little individualized instruction is possible.

The new approach will change this by employing online, interactive, modular tutorials and assessment. In

*continued on page 15*

## Cyber Education, *continued*

addition to individualizing the instruction, the technology-based materials will allow students to review chemistry in subsequent courses and will include examples and information from other disciplines that will help students to see the applications of the chemistry they are learning. To accomplish this change, professors must shift from being transmitters of knowledge via a lecture to being designers of individualized interactive materials and guides for the students. Teaching assistants will spend less time in lecture and discussion and will move to developing and assessing

the interactive modules and to guiding individual students. Students will be less passive and more engaged in learning through individualized materials and will receive more guidance for their individual needs.

The technological revolution is bringing significant change in teaching, learning, and scholarly communication. The use of information technology for simulation, collaboration, and communication has broken down the boundaries between the classroom, the lab, and the real world. It has helped us move from isolation to interconnections. Learning is viewed as something collaborative; students can now learn how knowledge is created, examined, questioned, and changed.

is the challenge universities face in working to improve public schools.

**Research on Learning.** Ever since President Lyndon B. Johnson provided for research on education in the Cooperative Education Research Act and Title IV of the Elementary and Secondary Education Amendments of 1965, research on learning and cognition has been a priority of some elements of the research community, and of practically no interest at all to most elected officials or education interest groups.

A recent manifestation of policy interest in education research can, however, be found in a 1997 recommendation from the President's Committee of Advisors on Science and Technology (PCAST). In its Report to the President on the Use of Technology to Strengthen K–12 Education in the United States, PCAST recommended that at least 0.5 percent of the nation's

aggregate spending for elementary and secondary education should be invested in federally sponsored research aimed at improving the efficacy and cost-effectiveness of K–12 education.

This would amount to be about \$1.5 billion in federal spending for research in learning-related disciplines and educationally relevant technologies; early-stage research to develop educational software and technology-enhanced pedagogy; and large empirical studies to determine which educational approaches work best in practice. Unfortunately, that report's bold recommendation has yet to be implemented.

The new information technologies are capable of fostering learning by offering individualized and group interactive access to information. They support learning independent of time and place and provide systems to manage learning that can enhance the ability of faculty to mentor and develop

## University Researchers and K–12 Students Engage in Hands-on Discovery

The University of Alabama at Birmingham is Alabama's only Primary Interactive Network Site in a project designed to excite and engage K–12 students and teachers in science and technology. This is accomplished through the use of an electronic connection to real expeditions that annually travel to different locations around the world. It involves students in the collection and transmission of data to a researcher in the field, via the Internet. This year's expedition will focus on the Amazon rain forest.

The foundation of the project is a multi-disciplinary science curriculum centered on the expedition site. The curriculum, designed to enhance the state's curriculum, provides students in grades 4–10 with hands-on learning opportunities using an inquiry-based, problem-solving approach. Teachers attend professional development seminars where they are instructed in the use of the curriculum. The project also uses extensive instruction through the Internet, several classroom satellite telecasts, and live satellite telecasts from the expedition site during two weeks in the spring.

A similar project is Mission to Planet Earth, a collaboration involving Rutgers University, the Hackensack Meadowlands Development Commission, NASA, and urban teenagers from 14 schools in the greater Newark area. To date, the students have learned how to apply space technology to land-use management. Fifteen students participated in a Space Technology Summer Computer Camp at the Rutgers-Newark Center for Information Management, Integration and Connectivity (CIMIC), where they were introduced to computer skills and taught how to use those skills as tools to solve real-world problems.

"Whereas the products these satellite images produced in the past were reserved for very sophisticated researchers, we have begun making the data available to a much broader audience, including planners, developers, and decision-makers," said the director of CIMIC. "In the summer, the focus of the effort is on students. This project gives urban youngsters the chance to work with state-of-the-art technologies, enables them to develop computer skills that will prepare them for post-secondary education, and takes them out of the inner cities to the Meadowlands to experience and focus on environmental challenges." Land-use challenges affecting the Meadowlands district serve as a model to help students learn about environmental issues and how those issues are interwoven into every land-use decision.

"The Landsat-TM images we are getting now show the different types of land coverages—green space, water, developed areas, etc.," said the Rutgers professor who coordinated the project. "The radar imagery detects areas that are littered with trash on the surface and under the reeds. We taught the students how to inventory contamination, which is part of the information needed to rehabilitate a site, either for preservation or development. This is a useful exercise for the students to realize how best to plan for the future for an area of this size (a 32-square-mile district). We encourage them to fine-tune their critical thinking skills and come up with scenarios for solutions after they have integrated the satellite images with planning documents. The students' culminating project was a presentation developed using Word, Excel, Power Point, and the Internet."

students according to their individual learning styles. The learning experiences that that technology enables are still new and open to considerable experimentation and research. Students at all levels need to have

information technology skills if they are to be competitive job seekers and workers.

Action on the PCAST recommendations thus is long overdue. Thanks to new breakthroughs in neuroscience

## Linking the University to Schools in Minnesota, Michigan, and Oregon

### Service Learning in Minnesota

"Minnesota Reads" is an undergraduate service-learning initiative at the University of Minnesota involving approximately 500 students and faculty who work with young children to improve their reading and language skills. Most of the efforts are aimed at improving the academic achievement of children in urban settings through after-school programs.

The University of Minnesota Center for Applied Research in Educational Improvement is a partnership with the Minnesota State Department of Children, Families and Learning and approximately 40 school districts. This partnership provides critically important technical assistance, evaluation services, and transfer of research-based practices to improve the achievement of students and the performance of schools.

In addition, the University of Minnesota Talented Mathematics Institute provides summer experiences in advanced mathematics for some of the state's most talented high school students.

### Computer Clubhouses for the Schools

At Michigan State University, the College of Education and a consortium of nine school districts in the state have been awarded a \$4 million grant from the U.S. Department of Education to develop computer clubhouses" in middle schools and at MSU to inspire students to achieve. Although the 10 sites will have similar structures and activities, each clubhouse will reflect local creativity in meeting specific needs. The clubhouse concept is a powerful intervention strategy for students at risk of failing in school. By tapping technology as a proven medium to improve student achievement in all areas and especially in reading and writing, the clubhouses will be venues where young people will develop the necessary technological expertise, not only to serve their communities, but also to serve as mentors, tutors, technicians, and ambassadors to their peers, teachers, and communities.

The project hopes to achieve four goals:

- Increase student engagement in learning through the use of computers and computer-related technology in safe, positive environments;
- Provide meaningful, integrated, and authentic learning opportunities through service learning;

- Foster the capacity of collaboration among students, schools, and communities; and
- Develop an innovative model of statewide collaboration for building student and staff capacity through the sharing of resources.

### Shared Curricular Design and Delivery

Portland State University is engaged in a collaborative project with two high schools in the Portland area (Grant and Westview) to explore reform through shared curriculum and faculty development. The project consists of teaching high-school seniors one of PSU's required year-long, Freshman Inquiry courses, "Embracing Einstein's Universe: Language, Culture, and Relativity." The course delivers an interdisciplinary, team taught and team created curriculum based on University Studies learning goals and objectives, which include communication, critical thinking and inquiry, and social and ethical responsibility. The curriculum infuses content with learning strategies to produce a rigorous and academically demanding program that supports student success.

Instructional teams are composed of high school and university faculty working with student peer mentors. Students who complete the program successfully and enroll in PSU earn 15 credits and move into required sophomore-level course work. The opportunity offers support and experience to motivated high school students and to those who are unsure of their placement or ability to achieve college-level work. At the high school the program is designed to achieve:

- Increased access to higher education for all students;
- High academic standards through curricular design;
- Demonstrable student performance in specified program goals;
- Connections with community needs and career potential;
- Smooth transitions among educational institutions;
- Increased faculty interaction and shared development throughout K-16 education;
- Integration of assessment in curricular design for improved teaching and learning and for program evaluation.

and biochemistry, scientists now understand much more than they ever did before about how the brain develops and decodes information. The implications of these new findings for teaching and learning are almost endless. Despite the lack of interest in learning research among many education interest groups and many elected officials, we should not permit this shortsightedness to obscure the obvious: A learning society requires research on learning.

**Higher Education and Public Schools.** Greater attention to the linkages between universities, pre-school education, and K–12 public schools is also needed. Public universities are the primary sources of new teachers and professional-advancement courses for teachers. These institutions in general, and public research universities in particular, have a special obligation to assist in the diffusion of successful innovations into the pre-school, K–12, and higher education sectors.

In public school systems throughout the nation there are excellent, innovative teachers creating wonderful new ways to teach and learn. Yet, these school systems usually have such weak or ineffective faculty-development programs that the successes of such teachers don't get beyond their own classrooms. Public school teachers are required to spend considerable time in professional development courses, but in many districts there is little coordination of what they learn in these courses with the real needs of students.

However, as more and more local school districts are networked into the Internet and set up interactive video

teaching facilities, public higher education will have new access to their classrooms. Innovative faculty at the university can communicate directly with teachers and students during the school day. These faculty can also discuss innovations on-line or on television with teachers in local school districts. Universities can offer programs directly to the schools about new research discoveries that can be adapted to instruction and about new pedagogical methods.

If public higher education assists public school administrators from preschool through high school with the process of restructuring, widespread change can be effected. In particular, the pre-school sector needs assistance in assessing and using technology for instruction and for administration, in developing strategic plans for the implementation of new teaching tools and methods, and in forming partnerships with business and higher education.

Strengthening relationships with primary and secondary schools benefits students at both the college and school levels. Teachers in the schools need assistance, but they also need the respect of university faculty and staff interested in working with them. University faculty need to know more about the social and physical environment in which school teachers function, and K–12 teachers and administrators need to be comfortable with the university people with whom they are working. Effective partnerships mean being attuned to the other partners' needs and to opportunities for providing appropriate research and instructional programs.

## University Issues

If public research universities are to live up to their full promise in the task of creating a learning society, their leaders need to think about encouraging some new ways of thinking. We will need academic changes supporting new ways of approaching teaching and learning, greater understanding of the implications and requirements of continuous learning, and new attention to the possibilities inherent in distance education.

The traditional focus on teaching in terms of exposure to a quantity of instruction must change to a focus on assessment of students' knowledge and skills. The rapid increase and change in knowledge in academic disciplines must be acknowledged in undergraduate teaching. Courses must address critical thinking and evaluative and

problem-solving processes. Students must be prepared to deal throughout their lives with the increases in, and obsolescence of, information by learning how the various academic disciplines engage in problem-solving and the advancement of knowledge.

An understanding of disciplinary processes rather than facts alone can best be developed through use of active learning pedagogy in courses. Passive listening in a classroom will not develop individuals with the talents needed for a productive life. Teaching methods that involve students in active learning, such as undergraduate research, service learning, and workplace internships, should be viewed as among the most powerful of teaching procedures, if the teaching goal is lasting learning that can be used to shape students' lives and the world.

## Using Libraries to Support Distance Learning

The Florida Distance Learning Library Initiative is a cooperative effort of the Florida Community College System, the State University System, and the public libraries of Florida, through collaboration with the State Library of Florida. Its purpose is to provide cost-effective, expanded access to library services in support of distance learning. This five-year statewide initiative, funded last year by the state at an initial \$2 million, builds on Florida's longstanding reputation as a national and international leader in the

field of library automation. The Distance Learning Library Initiative provides electronic access to a large collection of proprietary, online databases for students, faculty, and the community, through their homes or the nearest library. It also provides expanded library services to assist distance learning through computerized reference and referral services, electronic course syllabuses, library user training, document delivery, and expanded borrowing privileges.

## Undergraduate Research at Universities in Illinois and Florida

The Summer Research Opportunities Program (SROP) at the University of Illinois was established in 1986, under the direction of the Graduate Colleges of the Chicago and Urbana campuses of the University of Illinois and the Committee on Institutional Cooperation (a consortium of Big Ten Universities and the University of Chicago). SROP's goal is to identify and select highly qualified sophomores and juniors who are members of minority groups and who have grade point averages of 3.75 or better to participate in an intensive 8-week summer research program. Through workshops on graduate education, faculty mentoring, and research, the program prepares students for entry into graduate programs.

In the Illinois SROP, two-thirds of the students are from the University of Illinois campuses; the remaining are from historically black colleges and universities and those with sizable Latino student

enrollment. Students participate as research team members in on-going projects for 20–40 hours per week. Over 6,000 students have been served through the CIC/SROP since 1986, over 1,000 at the University of Illinois. Ninety-seven percent of these students earn baccalaureate degrees, and over half immediately enter graduate or professional degree programs.

At the University of Florida last year, more than 4,500 undergraduates took individual research or study courses where they worked directly with professors in labs or on other research projects. To help undergraduates find a faculty mentor who matches their interest, the university maintains an undergraduate research database on the Internet. This database currently contains information on 133 active projects, many being conducted by UF's top researchers and representing most fields of study on campus.

A new emphasis on learning will take time; it represents a major transformation in academic thinking. And it is essential if we are to move toward a learning society. To begin this transformation, it will be important to focus on the outcomes of learning and on the learning-assessment process so that it is clear what the university's aims and objectives are. We will also need to demonstrate the extent to which we are achieving these objectives.

To train students in the habits of lifelong learning, universities need to

place a new emphasis on pedagogies that are most appropriate for active learning and on the use of new learning and virtual-learning communities. Faculty must play a key role in shifting the focus from teaching to learning. To prepare faculty to undertake this transformation in their role, universities will need to invest in professional development and incentives for acquiring the skills needed to create active-learning environments and experiences in classrooms, laboratories, and service learning.

Universities should strive to create and use the most appropriate environments for learning, including libraries that are gateways to knowledge in electronic and other formats. Institutions need to provide active learning centers where students can explore, discover, evaluate, and work with the latest technologies to obtain informa-

tion through the new global networked systems and other sources. Among the areas to which a conscientious public research university should contribute in creating a learning society are digital library creation, expert systems and human-computer interfaces, knowledge management systems and educational software, electronic delivery

## Continuing Education for Professionals in Florida and Wisconsin

The University of Florida College of Pharmacy has a successful and unique distance education program called the Working Professional Doctor of Pharmacy Program. Nearly 300 students currently participate in UF's Pharm.D. program, without ever attending classes on campus in Gainesville. Using University of South Florida facilities and technical support for a nominal fee, UF videotapes sessions of lectures and case studies provided by faculty members in clinical pharmacy. These tapes are then distributed to cities throughout Florida and to Chicago, Dallas, and Houston. Students conduct a research project, and receive additional assignments via the Internet.

The Florida Engineering Education Delivery System (FEEDS), another continuing-education program, is a product of a cooperative effort of the State University System and public/private sector industries, to meet the needs of engineering graduates. Shifts in industrial and other needs require that many engineers must be re-educated so they can accept new responsibilities in engineering specialties different from those they originally

pursued. With innovative use of television (live and recorded), of telephone line-based teleconferencing, and computer-aided communication, the program brings students and professors together intellectually, regardless of their location.

A new program at the University of Wisconsin-Madison is designed to increase access to nationally recognized faculty in the area of quality improvement. Only a few students can take the traditional, faculty-intensive campus version of the classes, which use interactive case studies. Further, many potential students are employed in careers and cannot come to Madison or aren't able to attend at the time the courses are scheduled. Now, through Web-based technology, more students will be able to take the courses, working at their own location and on their own schedule. They will learn content in small modules and receive individualized feedback and direction. As active participants in an on-line learning community, they will work in virtual teams on projects relevant to their interests and their careers.

systems, and the like. It would be particularly appropriate for the university to contribute its research efforts toward furthering our understanding of technology-based learning, including the impact of the new multimedia and other interactive technologies on thinking and learning.

All public research universities now engage in partnerships through community and state outreach programs that draw upon the expertise of others and provide enriched learning experiences that benefit all; such activities will be even more important in a learning society. Such cooperative programs can help us to be more responsive to community needs, allow us to strengthen programs by drawing on external resources, and permit us to achieve new economies while serving citizens more effectively. The technological advances now occurring will help in the development of these new links and partnerships.

**Continuous Learning** For working adults, public higher education must make it possible for individuals to have access to opportunities that are necessary and appropriate for their learning objectives. Increased access must be matched by increased flexibility, such as the use of technology to support alternative delivery of programs, flexible programs that draw intellectual resources from a variety of areas, and programs that are able to provide learning opportunities at precisely the time they are needed. Support of lifelong learning opportunities requires a delivery system that is sufficiently flexible to respond to the demands that will be placed upon it.

**Distance Education** Distance learning is the linking of a teacher and students in several geographic locations via technologies that allow for interaction. This learning can take place at set times or at times that are convenient to the learners. The new distance-enabling computer-based technologies allow for new options for teaching and learning.

**Asynchronous Education** This means educational settings in which teachers and multiple learners can move at their own pace because they are not required to move in unison, at the same time, or even be in the same place. Such approaches offer many possibilities. Faculty can communicate with students through class conferences or electronically, on a one-on-one, small-group or full-class basis. Students can communicate with each other and with experts in the areas under study, wherever they are located, whenever it is most convenient for them. Students can do assignments from home, workplaces, dormitories, computer labs, whenever they have the time to work on their projects. They can, moreover, interact with information through the Internet, using it to query library catalogs, bulletin boards, academic "listserves," databases, and the like. Clearly, all this gives students the opportunity to gain experience navigating and searching the Internet and working with the multimedia information skills that are now basic to lifelong learning.

Distance learning and the technologies that support it have the potential of literally transforming the way that education takes place and may become

one of the most important means for bringing about a learning society, with students, employees, and individuals of all ages continuously using distance technologies to extend their knowledge, understanding, and skills. We should not, however, overstate what these technologies can deliver. We should approach these benefits through intensive research, experimentation, and examination of carefully mounted pilot projects, just as the President's Committee on Advisors on Science and Technology urged.

Research needs to be undertaken on the nature of the learning that people experience in an asynchronous learning environment. We need to know when and how frequently face-to-face contact between instructor and student needs to take place, and how these interactions contribute to learning. We need to assess the actual nature of the active learning that takes place when students interact with electronic and multimedia information and with other students via electronic networks.



# Making Our Commitment Real



RESEARCH IS AT the heart of state and land-grant universities' contributions to the learning society. It is the source from which many blessings flow, the origin of advances in every field of knowledge. Through research, we have won some of our greatest victories over disease and have made great strides toward extending human life, making our daily lives safer and more efficient, and enabling our economy to grow.

State and land-grant institutions have a tradition of making conscious connections between knowledge and action, theory and practice. Thus, as we formulate research priorities in support of a learning society, we need to increase our research activity in all of the areas that contribute to the creation, retrieval, delivery, and preservation of knowledge. In addition, it will be important to understand the pedagogies that are most effective in encouraging the application of critical thinking, problem-solving, and analytical skills in a technologically sophisticated environment, one rich in information resources.

As we move forward in this increasingly electronic environment, it is extremely important that our research institutions foster public and institutional policies that deal with copyright, licensing, information archiving, and preservation issues in ways that foster the dissemination and accessibility of intellectual property.

Digital media and software are issues in intellectual property that universities have been forced to confront for some years now, but ownership, control, and

compensation policies continue to develop as the technology changes and new media arise. Distance learning and development of continuing-education courses may require new policies.

## Costs and Benefits of the Communications Revolution

To the extent that resources allow, most of our institutions have been eager recruits to the revolution in communications technology, but the cost of networking our campuses (to say nothing of our other advanced technology needs) is not trivial. For example, one institution with three campuses that span a relatively small but very populous state estimates a cost of at least \$100 million simply to complete a backbone network and put cables into buildings. As universities broaden their missions to offer lifelong access to flexible learning programs, we need to persuade state and federal leaders that Information Age colleges and universities must integrate the costs of acquisition, renewal, and support of a high technology infrastructure into their operating budgets. This infrastructure is essential for access to information, for teaching our students to evaluate, use, and shape information with the tools of technology, for collaborative research and for lifelong learning.

All public institutions in higher education are keenly aware of the need to make heavy investments in the infrastructure for technology-enhanced learning facilities such as campus

## Managing a Learning Society in a Manufacturing Plant: The University of Vermont

In Vermont, the state's largest private employer is the IBM company's microelectronics manufacturing plant, with more than 7,500 employees. The entire staff development and training function of this company is part of an academic partnership with the University of Vermont and Vermont Technical College. This higher education partnership has created an industrial training "company" that provides over 2,000 courses and 250,000 contact hours of training each year to the employees of one industrial site.

There are many reasons for the continued success of this university/college-based training company. One significant factor in the ongoing operation resulted from the team leaders' insistence on the creation of an Education and Training Council that would guide the work of the company and would include leadership from both the educational institutions and IBM. The practical result of this unique organizational component has been a commitment to learning throughout the

partnership. The first group of council members has taught the higher-education members to operate using an outcomes model that seeks quick results. In return, higher education provides new facts about skill gaps in the workforce and the educationally best practices to close them. Together, this unique partnership works to improve IBM's bottom line.

Further, the University of Vermont now offers many engineering and graduate business courses at the IBM site through compressed video broadcast. University and college faculty are working much more closely with their colleagues at IBM to add value to their credit courses. Working through these contacts, higher education has helped to create a women/minority engineering scholarship program in which qualified undergraduates will receive work experience and the guarantee of an engineering position upon successfully completing degree programs.

networks, computing equipment, software licenses and upgrades, user-training programs, and expansion of support systems. To the extent possible, we are working to provide direct connections from dormitories, faculty offices, student workplaces, and dial-up links to the campus networks from homes in order to enhance teaching and learning on campus and deliver educational programs to remote learners. All of this is necessary, but the expense makes the implementation slow and painful.

Partnerships with the private sector are often recommended as one way institutions can reduce the costs of acquiring up-to-date hardware, software and campus wiring. As helpful as these partnerships are, for-profit

entities cannot simply give away the store: they are in business, and whatever they do must make business sense for them. The issue of cost, then, remains an obstacle.

At the same time, the communications revolution offers tremendous opportunities in global connections, an enormous pool of knowledge and expertise that discerning learners and well-connected researchers are able to tap almost at will. Although broad access to the Internet is so recent that its effects on research and learning have barely begun to be explored, early indications point to possibilities for collaboration and mentoring that are very promising. Even now, teams of researchers who do not work in the same laboratory or even on the same

continent have formed to work together, in constant communication and interaction, through the instant exchange of data and frequent conferences with colleagues in widely separated locations.

The availability of immense amounts of archived raw scientific data on the Internet will open the possibility of involving new participants—college students or even high school students—in research. Obviously, they will need the help, preparation, and guidance that only experienced and knowledgeable scientists can provide. Such programs are already under way, opening up to very young students the excitement and accomplishment of fundamental research in hands-on scientific work. A similar case can be made for non-scientific areas of research and discovery.

### **The New Competitive Environment**

All of these needs must be understood in the context of a new competitive environment. Many other new

participants, including for-profit companies, are eager to make the claim that they are better suited to meet the needs of a learning society than we are. Although the Eagleton Institute survey was well-designed to elicit the information the Kellogg Commission needed, critics who pointed out that lifelong learning is not solely the province of public universities were, of course, correct. It is important to define our role properly.

Community colleges have long been engaged in working with under-prepared students to bring them up to the college level with basic literacy programs, customized training for various occupations, and other employment-related education tailored to the needs of their communities. State colleges have traditionally been involved in lifelong learning through professional-development courses for teachers and school administrators throughout their careers. Independent colleges have had various levels of involvement and in some cases have been quite active, aggressive, and effective.

## **Linking Universities and Community Colleges in Florida**

Universities throughout the United States are finding more and more ways to team up with community colleges. As one example, in a cooperative effort between the Florida Division of Community Colleges and the State University System, the Web-based Florida Academic Counseling and Tracking for Students (FACTS) will include information about the availability of degree programs, tracking of degrees, transcript display, and assessments of students' progress toward graduation at their current institutions. The University of Florida has been using a similar online advising and tracking system for the past two years with much success. Its Universal

Tracking System has reduced excess credit hours, increased retention, reduced the number of academic suspensions, and reduced the number of courses dropped by freshmen in their first semester. With this new statewide advising system, Florida's college students will be able to log onto the Internet and see, in real time, how their academic records match up with each state university's requirements. High school students, parents, and advisors can use the online system to evaluate each college more efficiently and accurately based on a student's individual needs.

As many of the Egleton Institute's respondents realized, the land-grant universities' historical mission and traditions make them particularly well suited to take leadership roles in the learning society. Founded to democratize education, to apply research to agriculture and industry, and to make public service a guiding principle of their mission, land-grant institutions were, from their inception (as early champion Daniel Cort Gilman argued), much more than state agricultural colleges. The Morrill Act, Gilman insisted, was much broader than that: It envisioned strong, comprehensive institutions—in effect, National Schools of Science. He urged that the terms “national” and “science” be part of their names. And as other public research universities have evolved in this century, including our urban institutions, they too have actively reached out to broad sectors of society—educating students from diverse backgrounds, conducting and applying research to societal needs, and engaging in public service through a broad variety of mechanisms.

At the same time, the range of services being offered by the private sector also cover a wide spectrum. Some offer remedial secondary work; others are offering professional certification, or training, or even traditional professional education. Some providers concentrate on a very narrow, but nonetheless important, set of technical

skills; a handful promise to open access to a broad range of undergraduate degrees.

Public research universities should not underestimate the significance of these new offerings. In some ways, they are a sign of public or market dissatisfaction with the available postsecondary offerings. Neither can we let the public or public leaders beguile themselves with the fantasy that new entrants into the education arena can replace our specialized knowledge or duplicate our reputation for quality. The special talent we bring to the public table is the capacity to funnel into our communities and states new and existing knowledge grounded in disciplinary and interdisciplinary-based research.

As our institutions have demonstrated many times since their inception, they are capable of stretching the boundaries of the real world, in effect redefining its shape and the nature of knowledge: what is known, what is worth knowing, and how it should be understood. With that great tradition to draw on, we need not fear new competition. Nor should we imitate it. Just as new profit-oriented entities cannot duplicate our capacity for exploration and research, we have no need to take over or dominate, even if we could, the important work now being carried out by technical institutes, community colleges, and undergraduate and other public institutions.

## RECOMMENDATIONS

To advance the legacy we have inherited and to move forward toward the creation of a learning society, we offer three major recommendations:

### I. Make Lifelong Learning a Part of Our Core Public Mission

**WE RECOMMEND** *that state and land-grant universities reaffirm their public character and public mission by making lifelong learning part of their core mission.*

Several actions make up this goal:

- **Access.** We must broaden access to lifelong learning by providing a wide variety of teaching and learning opportunities and approaches, ranging from traditional on-campus instruction to Internet-based courses.
- **Partnerships** Partnerships of three kinds are essential. First, for the broadest, most convenient and effective use of our resources, we need to form partnerships with other institutions, especially community colleges, to provide high-quality academic programs and services to students in cost-efficient and accessible ways. Second, partnerships between the higher education community and pre-K through 12th grade education are essential to preparing young people, not only to be successful in college, but also to learn throughout their lives. Third, we also need to increase and improve partnerships with government, business, and professional

associations to plan in advance for the educational needs of the workforce, so as to meet those needs on a timely basis through on-campus classroom instruction, on-site instruction in workplaces, and distance learning.

- **Mission Differentiation.** We must encourage state systems of public higher education to differentiate institutional missions in higher education so that resources are used in the most effective and efficient ways possible, from specific-job skills training to on-going education not linked to special occupational skills.
- **Accreditation.** To ensure quality in lifelong learning, we must engage accreditation associations, both regional and professional, in discussion of the formation of appropriate standards for lifelong learning and appropriate expectations for institutions about programs offered through distance education. Other groups, such as the Council for Higher Education Accreditation, have already raised these issues. (Assuring Quality Learning, April 1998.)

### II. Create New Kinds of Learning Environments

**WE RECOMMEND** *that institutions aim to equip their students with the higher-order reasoning skills they require for lifelong learning, while providing faculty with opportunities and incentives for professional development so that they can acquire the pedagogical skills needed to create active learning environments.*

Again, several actions are needed to reach this goal:

- **HigherOrder Reasoning Abilities.** In order to keep pace with continuous change, learners must develop the ability to use complex skills such as critical thinking, problem-solving, and the use of abstraction and analysis.
- **Upgrading Skills.** Since people will have to be able to renew their professional skills or change their career directions several times during their working lives, they will need easy access to the programs and institutions that will allow them to do so.
- **Enlarged Dialogue.** Through interactive media, our students will be in virtually constant communication with us, telling us what they need and returning to update and add to their skills throughout their lives.
- **Faculty Development.** Faculty must be provided with opportunities and incentives for professional development to enable them to acquire the skills needed to use active learning pedagogy and to enhance their use of information technology as a tool in teaching and learning.
- **Research on Learning.** To provide the best possible basis for our efforts, we need to encourage research on the learning process, with the goal of creating a science and methodology to discover how we can most effectively present

knowledge to the human senses. Teachers and learners will need to assimilate, evaluate, analyze, generalize and apply such knowledge.

- **Technology in Teaching.** The new learning science must address techniques for interaction, collaboration, and natural communication through computer systems. Such systems provide information and offer asynchronous communication, as well as opportunities for collaboration and interactive manipulation as part of learning.

### III. Provide Public Support for Lifelong Learning

**WE RECOMMEND** *that state and federal governments acknowledge the significance of lifelong learning by taking the necessary steps to meet the public need for it.*

For example:

- **Public Investment.** To further develop the intellectual capital that is the foundation of our economy in the Information Age, public investment in systems of higher education must be increased to keep tuition affordable for all students, including continuing-education students and those who study through distance education.
- **Research.** Competitive, peer-reviewed grants for research in effective learning methodology, including distance learning and technology-based learning, must be offered.

- **New Aid Policies.** Federal and state financial aid policies must be revised to meet the needs of lifelong learners.
- **Public Demand.** In our time and for the foreseeable future, the most important assets of our nation are knowledge and knowledge workers. We are responsible for educating these workers, and we must be responsive to the new demands that public higher education reach deeper, range more broadly, and expand to greater heights than ever before.
- **Public Investment and Pricing.** While education is more necessary than ever before and public demand for it is increasing exponentially, many states, pressured by health care costs, prison obligations, and K–12 needs, have been less willing to make substantial new investments in higher education. Accordingly, different state institutions may find it necessary to adopt different policies on pricing lifelong education.
- **Public Outreach.** We will all need to keep in mind the public service character of this new and expanding obligation to our constituencies, to pursue and take advantage of the research on learner-centered education and technology-based interactive learning and communication, all of which may ultimately offer more effective, economical, and efficient educational methods.
- **The High-Technology Infrastructure.** Another of the requirements for the transformation in public higher education is the high technology infrastructure that is required for access to information, for cutting-edge research collaboration, for better direct service to all of our constituents, and for teaching our students to evaluate, use, and shape information with the tools of technology. Building that high-tech infrastructure is a task just as large and important as the construction of our railways in the 19th century or our national highway system in the 20th century. Several federal agencies, working with high-tech corporations, have already had the vision to pledge substantial resources to launch Internet 2. The academic community, responsible in large measure for developing the Internet itself, needs to support this new development equally enthusiastically.
- **Networking Our Campuses.** To realize the full promise of the high-technology infrastructure, an enormous undertaking in the form of wiring our laboratories and dormitories lies before us. Like every infrastructure, this one is an investment essential in the present and indispensable in the future. For our part, we are addressing this tremendous challenge through reallocation of budgets and partnerships with business and with our state and national political leaders who have a vision for the

## State Support for Distance Learning

Inspired by a 1995 Washington State University national survey on what the public wants from higher education, the State of Washington approved in 1996 and inaugurated in 1998 a \$54.5 million K-20 Educational Communication Network, to link schools of all levels throughout the state with a web of fiber-optic lines, routers, and computer centers. The first phase of the project links all of the two- and four-year state colleges and universities and the nine educational service districts of the public schools. WSU has established learning centers in six locations throughout the state with Internet access and satellite downlink capacity. Three have two-way audio and video access.

The State of Wisconsin is building a web of voice, data, and video networks called BadgerNet to serve all state agencies, local governments, University of

Wisconsin campuses, technical colleges, private colleges and universities, public and private K-12 schools, and libraries.

In 1998, the University of North Carolina system asked the North Carolina legislature to fund its off-campus, distance-education enrollments, whether face-to-face or electronically mediated, in a manner comparable to on-campus instruction. (In 1996-97, state funding became tied to the production of student credit hours.) The proposal persuaded the General Assembly to grant \$12,890,335, considerably less than the \$18 million requested, but the North Carolina system requested additional funds for 1999-2000 and for 2000-2001. The University of Nebraska is planning a similar approach to its state legislature.

future of our nation and the courage to make that vision a reality. Yet our institutions need additional capital funds for the

installation, and operating budgets for the acquisition, renewal, and support, of the new technology.

# *A Learning Society: Promises to Keep*



A NEW CENTURY brings with it new uncertainties. The American people and their educational leaders face many challenges, but they can face the future with confidence if they create an environment with many opportunities for a lifetime of learning: a Learning Society.

This is not the first time the recommendations outlined in this document have been put forward. State universities have long believed that lifelong learning should be at the core of their public mission. They have sensed that new kinds of learning environments must be created. And they have made the case that public demand for educational opportunities must be matched by public support for public institutions. But it is time that these recommendations are put into place so that, at last, this work can be done.

In outlining the ambitious agenda contained in this report, the Kellogg Commission does not pretend that it

will be achieved easily or quickly. Doubtless we will encounter many detours; a victory here will be matched by a disappointment there. Inevitably, obstacles will have to be surmounted and distractions overcome.

One thing is clear, however: Our society, its leaders, and its people must take up this challenge. The United States has many promises to keep. Among the most important is that all Americans, by virtue of effort, industry, and the quality of their performance, are entitled to the fruits of success, to reach as high as their hopes inspire them, and to travel as far as their aspirations lead them. If this society is to make good on that promise, no issue is of more profound significance than the quality of the learning opportunities provided across America.

The Kellogg Commission is committed to fulfilling that great promise. We invite all who care about the nation's future to join us.



## APPENDIX A **ACKNOWLEDGMENTS**

THE COMMISSION WANTS to express its gratitude for the contributions of many individuals and organizations whose assistance made this report possible.

Our first acknowledgment goes to the board and officers of the W. K. Kellogg Foundation for their support of the Commission. In particular, we want to thank the President of the Foundation, William Richardson, for his commitment to this effort. Trustee Wenda Weekes Moore was a faithful and hard-working member of the Commission's National Advisory Committee, and Richard Foster and Gail Imig from the Foundation's staff were tireless and committed friends of the Commission.

We also want to acknowledge the contributions of the other members of our National Advisory Committee, under the leadership of Roger R. Blunt, Sr., Chairman and CEO of Blunt Enterprises. Paula Butterfield (Mercer Island School District); Donald E. Petersen (retired Chairman and CEO of Ford Motor Company); Walter Scott, Jr. (President of Peter Kiewit Sons, Inc.); Mike Thorne (Executive Director of the Port of Portland); and Edwin S. Turner (President of EST Enterprises) made major contributions to our understanding of these issues.

Particular acknowledgement goes to the committee that guided the development of this report under the superb leadership of President Francis Lawrence of Rutgers University. The members of the committee, including Ray M. Bowen (Texas A&M University), W. Ann Reynolds (University of Alabama-Birmingham), Mark G. Yudof (University of Minnesota), and Nils Hasselmo (Commissioner Emeritus), each brought a unique perspective to the development of issues surrounding the role of the public university in a Learning Society.

But it is to Fran Lawrence to whom singular recognition must be given. President Lawrence not only provided exemplary leadership to the committee and guided the discussions of the entire Commission, but personally drafted the original manuscript on which the final report is based.

Working with the draft report prepared by Dr. Lawrence, a number of individuals provided editorial skills that led to the version of the report presented here. They included James Harvey (Harvey & Associates); John Byrne (President Emeritus of Oregon State University); Michael Vahle and Cheryl Fields of NASULGC; and Carol Mason of Oregon State University. To all we are indebted.

We thank the friends and colleagues cited in Appendix B who took the time to share their views with us.

We are grateful to the capable and hard-working staff that helped guide our work. John V. Byrne, President Emeritus of Oregon State University, served ably as Executive Director of the Commission (and as an ex officio member of the Commission). Dr. Byrne had the assistance of a Steering Committee that included Gail Imig (W.K. Kellogg Foundation); C. Peter Magrath (President of the National Association of State Universities and Land-Grant Colleges); Cheryl Fields (Director of Public Affairs, NASULGC); James Harvey (Harvey & Associates); Stephen J. MacCarthy (Executive Director of University Relations, The Pennsylvania State University); Richard Stoddard (Director of Federal Relations, The Ohio State

University); Teresa Streeter (Director of Administration, NASULGC); and Michael Vahle (Office Manager, NASULGC). Each of these contributed immeasurably to our efforts.

Several consultants assist us also: Cathy Henderson has developed working papers for many of our reports, including this one, and James Harvey helps with drafting and editing these documents.

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We also gratefully acknowledge the contribution by the staff of the Eagleton Institute of Politics of Rutgers University who conducted the Lifelong Learning Survey.

**APPENDIX B MEETINGS, GUESTS, AND SPEAKERS**

<b>Date(s)</b>	<b>Location</b>	<b>Guests and Speakers</b>
December 1–2, 1998	Washington, D.C.	William C. Richardson President, The Kellogg Foundation
April 13–14, 1999	Washington, D.C.	Paul H. O’Neill Chairman of the Board and Chief Executive Officer, Alcoa







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