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The Preparation of Future Faculty for Metropolitan Universities

Neither the traditional land grant universities nor the more recently created metropolitan universities have been able to keep up with the rapidly emerging problem of modernization. The premise of this article is that this situation is rooted, in part, in the education and development of the faculty of those universities. The need for change is discussed here, as well as the role of the university in modern society, and prescriptions are given for the preparation of the future faculty.

Eighty percent of the population of the United States now resides in metropolitan centers. This share is similarly high in other developed countries. And many developing countries are well on the way to concentrating their populations in urban centers.

Numerous U.S. cities have witnessed major transformations of their physical structures and facilities over recent decades. The clutter of old buildings and transportation systems has been cleared out, and new highway systems and beautiful buildings rise on the wastelands of the past. However, the social problems of our metropolitan centers persist and, if anything, are becoming more serious. Families continue to break down at an alarming rate. An ever larger share of our children are born into single-parent families. Chemical abuse is widespread. Poor people are confined to parts of the city where there are no jobs. Our nation wastes a large share of the potential of its human capital because it has not found ways to solve its social problems or to invest in its human resources at socially optimal levels.

Those who in the past looked to metropolitan or urban universities to solve the problems of our urban centers have been disappointed with their failure to do so. Some observers make disparaging comparisons with our land grant universities, which are given credit for having transformed rural America and for having given this nation what has been judged to be the most productive agriculture in the world.

This unfavorable comparison is misplaced. The land

grant universities *were* successful in modernizing the *production* side of agriculture. They did a great deal less, however, to deal with the social problems of rural America. To their good fortune, an important share of these social problems was dumped into our metropolitan centers. These problems merged with, and aggravated, the social problems that arose there in conjunction with the enormous transformation of our economy after World War II.

The problems of our universities are far more deeply rooted than their inability to address the problems of urban America alone would suggest. Despite their ability to produce new knowledge at an astonishing rate, they have not yet found ways to organize themselves and, thereby, apply that knowledge effectively to the solution of the social dislocations and problems that arise as the fruits of their research efforts transform the economy and society. Moreover, they are failing, even, to transfer the technical knowledge they generate to the private sector. Thus, the nation that spends the highest share of its GNP on R & D, and that has earned a dominant share of Nobel prizes in science in recent years, finds itself lagging in its ability to compete internationally, not only with modern industrial giants, such as Japan and Germany, but also with newly industrializing countries, such as Hong Kong, Singapore, South Korea, Taiwan, and, to a lesser extent, Brazil and Mexico. Similarly, the growth rate of the U.S. lags behind that of other countries, and its urban problems grow like a cancer.

These failures of U.S. universities are rooted, in part, in the education and development of their faculty. Of equal importance, however, is that the failures are rooted in how the faculty are managed in their academic endeavors. This article discusses both sets of issues.

Metropolitan universities vary a great deal in their organization and in what they take to be their mission or missions. An important premise of this article, however, is that such universities have a special obligation both to the population of their region and to the welfare of the nation as a whole. Other important premises are:

- scholarship and the pursuit of knowledge must be the primary mission of modern universities; and
- such universities must pay attention to the dissemination and application of the new knowledge they generate. Furthermore, they must contribute to the economic and cultural development of the area they serve if they are to gain (or regain) the public support they need to carry out their primary missions.

The Need for Change

U.S. universities, more than those in almost any other part of the world, have been characterized by two important features: (1) education for the

masses; and (2) the application of knowledge to the solution of problems in society. These features are a consequence of the creation of the land grant colleges and universities, a uniquely American innovation that has been widely emulated both by other countries and by other educational institutions within the United States. The land grant universities were created as a reaction to the elitism of eastern liberal arts colleges and to their lack of relevance to the emerging problems of a rapidly industrializing society. The establishment of the land grants effectively put higher education at the service of economic development and the further evolution of society.

This important institutional innovation has served U.S. society quite well, and for a time, helped the nation to be both the scientific and technological leader of the world. The general spread of the tripartite mission of resident instruction, research, and outreach or extension among U.S. universities is evidence of the vitality of the basic idea. This also is true of the continued strength of the idea of mass education, as evidenced by the proliferation of publicly supported higher education institutions in the form of additional (non-land grant) state colleges and universities, as well as community colleges dedicated almost exclusively to resident instruction.

Higher education in the United States, however, has been under stress for some time. Among the manifestations of this are the following:

- The nation is losing its international competitive edge.
- The U.S. is no longer the scientific leader in many fields.
- Employers complain about the inability of graduates to apply their knowledge effectively to current problems.
- Serious social and economic problems are unresolved.
- And universities face recurring budget problems and are underfunded relative to the demands placed on them. Moreover, as one looks to the future, the challenges U.S. universities face promise to become even greater.

It is little wonder our universities are undergoing such severe stress. The environment in which they operate has undergone significant change, and the demands on them have grown enormously. Understanding these changes and the increasing demands they represent is the key to revitalizing institutions of higher education and to preparing them to deal with the problems expected to emerge as the twenty-first century approaches.

The first important development has been the veritable explosion in knowledge created by past investments in science and technology in this country, and increasingly in other countries. This knowledge explosion, in turn, has several consequences. For example, advances in science have moved the frontier of knowledge further and further away from the application of knowledge to the problems of society. Academic disciplines have become increasingly specialized, and new knowledge on the frontiers of

science is becoming more abstract. This enlarges the communication problems among scientists and professionals in the various fields. The explosion in knowledge also alters the character of education needed, both for those who intend to be scientists and for those who will use that knowledge eventually to address problems of society. Basic disciplinary work and the application of knowledge have become further divorced and separated. In fact, the large research universities in this nation have become increasingly like the German model, emphasizing knowledge for its own sake.

Another consequence is that economic growth and development are becoming still more rooted in human capital than in physical capital. This stock of human resources includes the genetic endowment of the society, knowledge, investments in new technology and in education and training, in the health of the population and its nutritional status, and in its institutional arrangements.

The design, creation, and management of institutional arrangements is to social scientists what new technology is to the biological and physical scientists. Institutional arrangements are the various means by which individuals in society relate to each other. They range from informal and formal rules of behavior, to policies implemented by government, to organizations and entities such as universities, the family, and social security. Sound institutional arrangements contribute to economic growth in the same way as new technology. Equally as important, they strongly influence how the benefits of economic growth are shared in society.

The value of the stock of human capital in a society like the United States today simply dwarfs the value of its stock of physical capital. Moreover, increases in the net domestic output of goods and services results increasingly from investments in science and technology and in other forms of reproducible human capital.

Two important implications follow from this proposition. The first is that in the future, the growth and development of the U.S. economy will be determined increasingly by its investments in the full range of human capital—from the *generation* of new knowledge on the frontiers of science, to the *application* of that knowledge, to the training and education of its populace in the latest knowledge as it emerges, to investments in the health and nutrition status of its population, and to the design and development of new institutional arrangements for an ever-changing society. Investments in physical capital still will be important, but this capital will be valued more for the knowledge imbedded in it than for the physical capital per se. This is despite the fact that the total rate of investment still will influence aggregate growth rates. The second implication is that this nation's ability to compete in the international economy also will be determined more and more by these same investments in human capital.

The second development in the U.S. economy consists of large and significant demographic changes that already are under way and that can be expected to continue in the future. These changes, too, have a number of important dimensions. The first is the gradual extension of life expectancy and the aging of the population. An important implication of this development is the need for lifetime learning and the institutional means to provide education for that purpose. This becomes especially important in light of the knowledge explosion, which makes old knowledge obsolete.

A further change in U.S. demographics is the emergence of an increasingly ethnically diverse population. Asians and Hispanics make up an ever larger portion of our population. Together with the blacks and Native Americans in our society, important segments of these population groups tend to be educationally disadvantaged. If the nation is to take full advantage of its population stock, and at the same time provide for a more equitable distribution of income, ways will have to be found to provide these population groups with the skills and knowledge to participate in a modern market economy and in the political processes that select our leaders and establish our policies and institutional framework.

In addition, our society has become increasingly urban. We were essentially an agrarian society at the time the land grant universities were established, despite a rapidly emerging industrial sector. Today, we have become essentially an urban society, with the service sector increasingly the predominant part of the economy. The institutional arrangements that enabled universities to contribute so much to the modernization of agriculture and the development of an industrial colossus have faltered in addressing the problems of urban America and in the modernization of the service sector.

These circumstances present what may be one of the most serious challenges modern universities face. As noted above, the seriousness of this problem is rooted, in part, in the failure of society in the past to address the human capital problems of the rural sector. As migrants from rural areas collected in the urban centers, residents left for the suburbs. The result has been city cores with mostly underdeveloped stocks of human capital. Moreover, modern universities, even those located in such urban centers and mandated to address the problems of the urban core, have failed to devise policies and institutional arrangements to solve these problems.

The Role of the University

Modern universities contribute to society through what now has become a classic triplet of missions: (1) resident instruction; (2) research; and (3) outreach or extension. The first two of these are clear-cut; the third is diverse and characterized by considerable ambiguity. Generically, however, the third refers to the application of knowledge to the solution of problems

society faces, to the design of new policies and institutional arrangements, and to the extension of the services of the university to the broader population and society—beyond those of the resident student body.

Operationally, these three missions contribute to the development of society in three important ways:

- through the development and dissemination of new knowledge and new technology;
- through the design of new institutional arrangements and the more effective management of the public sector; and
- through the development of the arts and values for a modern society.

Modern universities tend to pride themselves on, and measure themselves by their contribution to the development of new knowledge. If they are to contribute effectively to the further evolution of society, however, they need to give more attention to assisting in the conversion of knowledge into technology and to the dissemination of that technology more widely in society. In addition, they need to give more attention to institutional design and innovation, to the management of the public sector, and to the promulgation of the arts and modern values.

New technology is the engine of economic growth in a modern society. It is reflected in new products, which provide new or improved consumer services or contribute more efficiently to production processes. It is reflected also in new production processes, which increase the output from conventional inputs of labor and capital. Such new technology must be disseminated broadly in society if economic growth is to be broadly based. If the new technology is generated with public funds, universities and others have a responsibility to see that it is available widely—to the poor and disadvantaged, as well as to the more well-to-do, and to the small firm and the large.

The failure of modern universities to give adequate attention to the design of new institutional arrangements is an important reason why economic growth is faltering in this country and why such serious social problems have emerged. We witness the breakdown of the family, yet no new institutional arrangement arises to provide the services once provided by the family. We have a health *recovery* system, but not a *complete* health system that would include preventive medicine. Similarly, we experience a society which is increasingly based on knowledge, yet we fail to develop new institutional arrangements to assure that all members of society have access to that knowledge. Finally, a truly international economy and society emerges before us, but we fail to develop the institutional arrangements which would enable us to find our way politically and economically in that new society.

In addressing the important social problems of equity or access, Amartya Sen (see Suggested Readings) enjoins us to take individual freedom as a social commitment. Such a social ethic is more widely based than

political freedom, and includes economic freedom and the alleviation of poverty constraints as well. In Sen's view, a social commitment to individual freedom must involve attaching importance to enhancing the capabilities that different people actually have; the choice of social arrangements must be influenced by their ability to promote human capabilities. The universities, thus, have a major role to play in promoting individual freedom.

The promotion of the arts and the development and promulgation of values for a modern society are a growing challenge to metropolitan universities. Rapid advances in knowledge pose major ethical and moral challenges. We see this most obviously in the case of medicine, where advances in knowledge give rise to choices and options not available before. The side effects of new technology similarly open new alternatives, while in some cases creating new problems. More generally, important ethical and moral choices between present and future generations are emerging, reflected most obviously in the global environmental problems that are receiving increased attention.

Despite the emergence of these serious moral issues, universities have failed to address them in an effective way. Yet the church and religion, the means by which we addressed such dilemmas in the past, are becoming less and less important in our society—and some would say less relevant to these issues.

At a somewhat different level, advances in knowledge and technology make new concepts possible in the arts, and open up new opportunities and new technologies for artistic expression. They also open whole new dimensions to be exploited by the theater and the literary arts. The rapid growth in knowledge of the universe and its beginning is an important example. The failure to exploit these new opportunities is to sacrifice our potential for personal growth and development and, in turn, the potential for growth and development of society. Modern universities have a responsibility to further such goals, and to broaden access to the arts in society.

The Preparation of Future Faculty

If metropolitan universities are to address and solve the many problems they face, they need to develop the capacity to teach a student body that is increasingly diverse in terms of age, race, gender, and ethnic background. In addition, they need to educate their students to work and to exercise their civic duties in a world that is international in scope. This means that they must understand the cultures of other lands, the institutional arrangements in those lands, and the international economy that stitches nation-states together. Finally, they need to educate their students to address the moral and ethical choices they face in a modern society.

At a different level, these universities need to develop the capacity to do

more applied research, to deliver more technical assistance to both the private and public sectors, and to provide more policy analysis and institutional design. The particular capacities they require to deliver these services will depend on their location and the particular problems their metropolitan areas face.

Providing the appropriate teaching skills and the capacity to deliver the necessary services to the local community is, in part, an issue of resource allocation and choice among university administrators. It is also, in part, an issue of incentives. Faculty require financial and status rewards for excellence in applied research, for delivering technical assistance, and for undertaking policy research. It is also an issue of developing a sense of institutional mission, and the willingness and ability of administrators to mobilize and allocate faculty and resources to address the problems of society.

Universities need to advance the frontier of knowledge while addressing the problems of society.

An important issue is how to prepare the faculty for these new teaching missions and for delivering on the outreach or extension missions. A frequent suggestion is that more faculty need to have multidisciplinary training if they are to address the complex problems of society. That suggestion is misguided in my view. It confuses the need to have diverse technical skills to solve a particular problem with the issue of the form in which these diverse skills are to be delivered. Given the complexity of the problems modern society faces, faculty ought to be educated with the most advanced knowledge available. This requires specialization. Similarly, it fails to recognize that the universities must continue to make advances on the frontier of knowledge at the same time they address societal problems.

What is needed are institutional arrangements that can deliver multiple disciplinary capacities. The leadership for such institutes or centers need to be academic entrepreneurs, who can identify and conceptualize problems and who can meld together the various talents needed to solve those problems. Unfortunately, universities tend to undervalue academic entrepreneurship.

Individual faculty might develop additional disciplinary capabilities by adding further schooling to that end, either while they are acquiring their original disciplinary strength, or later in their career. Such capability should be *in addition* to the original strength, however, not at the expense of depth in the original field. The difficulty in not attaining strength in the primary field is that the individual would not be able to communicate with those on the cutting edge in their respective fields.

Another challenge is to have faculty who can teach in a culturally diverse way, who can solve applied problems, and who can extend their knowledge

to those in both the private and public sectors through technical assistance or through "external" courses. Not all of these abilities have to be in the same person, nor does each faculty member have to engage in all of these activities. Some understanding of the broad issues of society would be helpful, however, so faculty understand how what they do fits into the larger scheme of things and into the larger mission of the university.

Ideally, future faculty would have a strong liberal arts background. Whether this would be a full, four-year program, or whether a two-year program would be sufficient, would depend on the particular field. For those going into engineering and the biological and physical sciences, two years of liberal arts would probably be sufficient, especially if the liberal arts were related to the major. Two years of specialization following this liberal arts education might not be enough, however, and in those cases, a five-year degree would be necessary. Given the increase in life expectancy, the addition of another year to one's formal education would not seem out of line.

Education should, in general, become increasingly specialized as one goes through one's academic career. For those interested in policy issues, however, or in eventually working more generally with the larger problems of society in their academic careers, a professional degree after the basic undergraduate degree might be appropriate. An M.B.A., a degree in law, or a degree in public policy would be appropriate, depending on the interests of the individual. This would, then, be followed by the Ph.D. degree in the chosen field of specialization.

Broadening the Ph.D. degree itself is another way of widening the skills of potential faculty members interested in these broader issues of society. This could be done by adding a minor in the pertinent field, or fields, to the regular disciplinary requirements of the Ph.D. Just as in the case of the earlier discussion, such minors should be *in addition to* the regular degree requirements, not at the expense of them. This would appear to be a more efficient way of providing the needed breadth for those who want it, than to redesign the Ph.D. degree itself.

An alternative way of approaching this problem is to recognize the importance of lifetime learning for faculty members, in the same way we do for the general population. In that sense, one might imagine future faculty members starting with an undergraduate liberal arts program, possibly in the form of a five-year program, and then going directly into their specialization. They would, then, spend the first part of their academic career specializing in research in their chosen field. For those who want to continue with a research career, the first sabbatical would be dedicated to upgrading their skills in their chosen field.

Preparing faculty for the mission of a modern university requires a great deal more investment... sabbaticals need to be required of all faculty.

For others, who find themselves more interested in the broader societal issues or who find their vocational interests more on the side of applied work, the sabbatical might be better directed either to more education in one of the professional fields, or to a year of specialized training in fields that would better equip them with knowledge of the institutional arrangements in society.

Whichever approach is chosen, and this choice obviously would be that of the individual, we must recognize that preparing faculty for the mission of a modern university requires a great deal more investment in their own human capital than is being made currently by many, if not most, faculty. To remedy this problem, sabbaticals need to be *required* of all faculty. The advantage researchers have in academic careers is that in doing their research they continue to add to their stock of knowledge. Those interested in nonresearch fields within academia must find some way to continue to invest in their own human capital in a parallel way.

A major issue universities face today is how to further upgrade the skills of their existing faculties. One way to begin this process is to start now to enforce the requirement of obligatory sabbaticals. These sabbaticals can be used for the same purposes as above. Special attention should be given, however, to further education which gives faculty a better understanding of diversity issues, which gives them stronger insights into the problems of society on which their basic skills bear, and which gives them a better understanding of the international economy and society.

If sabbaticals become obligatory, an important issue will be how to ensure that they actually are used to good purpose. Assuring this should be a natural responsibility of the academic leadership. Sabbatical leaves typically need to be approved by the dean. It will be the responsibility of the person occupying that position, or of somebody designated by the dean, to work out mutually satisfying arrangements.

Requiring that sabbaticals be taken may become easier in the future. The end of obligatory retirement at sixty-five or seventy probably will cause most universities to require some form of periodic evaluation that goes much beyond those now in place. This will be added incentive for faculty to undertake additional investments in their skill levels. It also may provide them with the incentive to broaden their skills at later stages of their careers, so their skills will be relevant to the multiple missions of the university. To do so later in their careers is natural, since not only do their own interests broaden, but also faculty become wiser in the needs of society.

Upgrading the skills of existing faculty in the above ways is expensive. Because a larger share of their faculty will be on leave at any given time, universities will need to have a larger faculty to deliver a given level of services. Moreover, programs will suffer discontinuities in some cases. In addition, it is increasingly difficult for faculty to receive financial support for

sabbaticals as they move through their careers because their salaries are so high. It may be that in the future, universities will need to provide a larger share of, or full financial support for sabbaticals.

This problem of costs, however, has to be approached as an investment which will have a high payoff over the longer term to both the university itself and to society. Sustaining and developing the skills of their faculties is critical to universities' being on the cutting edge and contributing more effectively to society. After all, universities are uniquely based on knowledge and function in an environment in which that knowledge is always changing. Just as factories always must renovate and renew their machinery, equipment, and physical plant, so do universities need to continually renovate and renew the knowledge base of their faculty. To make this feasible, universities may require establishment of a depreciation fund for their human capital, in the same way a private firm has a depreciation fund for its physical capital. To establish such a fund as a regular part of a university's budget would make explicit the extent to which the knowledge and skills of its faculty are one of its primary resources.

Another important issue is the extent to which suggestions made above require faculty to spend more time obtaining their original education and investing in the development of their knowledge base later in their careers. The costs of this additional time will be made up by increases in life expectancy, and by an increase in productivity. This increase in productivity should elicit an increase in real salaries.

Concluding Comments

Revitalizing our universities is critical to revitalizing our economy and society and to sustaining our place in the international society and economy. This revitalization requires that we develop faculty with the skills needed to fulfill the broader missions that modern universities require, and to cope with the rapidly expanding body of knowledge. This necessitates lifetime learning on the part of the faculty, and the continuous investment by both the faculty and society in the upgrading of their skills. These will not be wasted investments. They are critical to the future health of our society.

Suggested Readings

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