

In an Information Economy, Universities and Businesses Compete for Workers

By Stanley Pogrow

THE TERM "DOUBLE-BIND" DESCRIBES the Catch-22 situation that may arise when organizations try to solve problems by increasing the scale of existing efforts without fundamental changes in strategy. In so doing, institutions exacerbate the original set of problems to such a degree that the probability of finding solutions is diminished. The double-bind approach tends to appeal to large organizations because it enables them to mobilize around familiar battle cries. The recent experience of Chrysler, which tried to salvage an outmoded marketing strategy by increasing its marketing effort, suggests that double-bind strategies bedevil the private as well as the public sector.

Proposals for dealing with the current fiscal problems of university research are a prime example of what could be called double-bind-think. Debate about the current status of scientific research in universities seems to be limited primarily to questions of scale. The general belief is that if financing levels were increased and government regulations reduced, university research and universities in general would flourish. Such belief forms almost the sole basis for institutional lobbying and for the internal management strategies of universities. The validity of this belief is questionable, at least in part. It doesn't explain, or provide a remedy for, the current problem of "academic flight"—faculty members and students voluntarily leaving academe.

In previous times, fields that were experiencing rapid expansion of knowledge generally found it easy to attract new faculty members, and fields where jobs were plentiful found it easy to attract graduate students. This is no longer true. A number of fields in applied science, such as computer science, physics, and electrical engineering, where knowledge frontiers are being rapidly extended, are experiencing increasing numbers of unfilled faculty positions, a reduced aging faculty, and declining graduate enrollment (with students leaving at earlier points in their graduate training). As an example, the National Science Foundation has estimated the number of

unfilled faculty positions in electrical engineering at 10 percent of existing positions. If foreign students and academics are excluded from available statistics, the decline and shortfall become even more dramatic.

The principal cause of academic flight is, in my opinion, a fundamental change in the nature of work, which is causing an intersection between the role of the university and that of private enterprise. When the primary activity of the private sector was farming, and then later the production of industrial goods, the delineation of the roles of universities and commercial organizations were obvious. But we have now entered the age of which the economist Marc Porat terms the "information economy," where the primary business of business is the generation and manipulation of information. This, however, is largely what universities do. The major implication of this new intersection is that business is going to have to compete aggressively with universities for "knowledge workers," and as this intersection grows, the cost in opportunity of being a graduate student or professor will increase and the problem of academic flight will worsen. Such a trend would have disastrous implications for the future role of institutions of higher education in knowledge production. The longer-term implications of academic flight for the tradition of academic inquiry are less clear. One can expect, however, a blurring of traditional distinctions in where basic research is performed and by whom. This is presently happening to some extent in biology.

Under conditions of competition in the generation of knowledge, increasing federal support for university research will not, in and of itself, reduce the problem of academic flight since it is in the business's fundamental interest to outbid the universities. Business is also likely to find it possible to outbid at levels which exceed those that public financing could reasonably be expected to provide for higher education. A policy of massive increases in federal support for university basic research under such conditions is only likely to drive up the cost to the public of supporting the academics who have the least potential for advancing the frontiers of science. Indeed, a more

rational strategy under such circumstances would be for the government to keep financing levels relatively stable and increase the extent to which the funds are focused on particular institutions, individuals, and research areas.

IF THE PROBLEMS NOW SURFACING in several key areas of academe cannot be solved by increasing federal support but instead require fundamental change, the question remains as to what strategies are most appropriate. It would seem that the only way to reduce industry's incentive to outbid universities would be to give industry the opportunity to obtain the needed services of academics as academics. The fact that industry could obtain help in generating knowledge at a lower cost than doing it in-house would help alleviate (not eliminate) the need and pressure to recruit from academe. All parties would benefit from setting up cooperative institutional arrangements whereby universities would respond to directed applied-research needs of industry in return for industry's also providing additional funds for nondirected university basic research. Such arrangements would, of course, have to be initiated before key academic departments become so denuded that they have little to offer. One major computer company has already established its own master's-degree-granting institution in response to its perception of a decline in the quality of existing programs in higher education.

Despite the problems that can be foreseen in attempting to establish cooperative relationships (such as patent control and existing university reward systems), there are a number of trends that support the feasibility of such an approach. Universities do have a strong tradition of performing *applied* research. During the last decade, the amount of financed applied research performed by universities tripled. The amount of such research performed by universities and university-administered federally financed research-and-development centers now accounts for 15 percent of all applied research (as compared with 60 percent by industry).

AT THE SAME TIME, the most rapidly growing source of financing for university basic research has been industry, which increased its share from 2 to 3 percent during the last decade. A recent *Wall Street Journal* article suggested the potential for large future increases in industry contributions to university research. In addition, much of the support for basic university research in the past decade was generated by responses to the direct pragmatic needs of external clients such as the Department of Defense. Finally, viewing industry as an ogre that has no appreciation of the importance of basic research is not only unproductive; it ignores the reality that industry will perform over a billion dollars' worth of basic research this year (approximately a third of the amount that universities will do).

There are a number of programs that have recently begun to foster greater interaction between industry and university research.

Although relatively small, the Industry-University Cooperative Research and the University-Industry Center programs in N.S.F. are steps in the right direction. A number of universities have, on their own, recently begun to establish cooperative ventures with industry in a number of fields. The initiatives for genetic-technology centers made during the Carter Administration will provide another test of whether industry can be persuaded to provide money for basic research performed by academics.

It must be recognized that the fundamental changes that are occurring in the way new material goods are produced have important implications for educational institutions. Tying education to the opportunity to work was the primary catalyst in the emergence of mass education as we know it today. Shifting the role of work to that of knowledge utilization is an equally profound social movement, which may have the power to alter the way in which education is provided and knowledge produced. The pre-eminence of the role of institutions of higher education in these activities is no longer guaranteed.

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