

200 state-level science parks, along with 63 university-owned science parks.

Currently, it is understood that universities should play a much more interactive role in these parks. Some parks are literally designed to encourage the development of a single community of university and industrial researchers. It is also no longer adequate to recruit industrial and other research and development organizations into these parks; a much greater interest now focuses on incubation of new high-tech companies. Another common approach is to add seed or venture-capital arrangements, management support, and business net-

*Research-oriented universities in Organization for Economic Cooperation and Development countries now have technology-transfer offices for research-related functions.*

working. Yet, today, even though a larger number of venture-capital firms operate globally, many of them are less willing or capable of funding and supporting early university spin-offs. Specialized arrangements for early venture funding and management support directly linked with universities are increasing, often backed by government money. However, many of these options fail as it is not easy to replicate the true expertise needed. Israel and Taiwan were unusual in taking early actions both in building direct relationships with Silicon Valley but also in attempting to build expertise for the domestic venture-capital industry.

#### INTERNAL MECHANISMS FOR INTERDISCIPLINARY WORK

Many universities are undertaking interdisciplinary research and education to address real world issues, but developing internal mechanisms for interdisciplinary work is not an easy trend. American universities have a long tradition of interdisciplinary research units that draw on academics from multiple departments. Since the 1980s, larger pioneering interdisciplinary initiatives have continued to emerge. Massachusetts Institute of Technology's Energy Initiative is an institute-wide initiative to address the world energy crisis. It is not a research institute; it is set of programs, covering not only research and education but also campus energy management and outreach. At Stanford and MIT, such initiatives today will automatically have affiliated industry partnership programs—to ensure that interested industrial partners can participate and contribute.

#### INSTITUTIONAL LEADERSHIP

Large-scale partnerships with industry are increasingly established not only in the United States and Europe but also in Asia, most notably in Singapore and China. However, what

sets institutions such as MIT apart is the institutional capability to identify a key theme around which to rally multiple industrial partners and diverse academic groups. Such ventures involve the need to strike a fine balance between top-down opportunity creation and bottom-up idea generation. Critical ingredients of such a capability appear to be two types of institutional leadership. First, to lead such initiatives, prominent academics are needed who are well respected by the academic community but also have credibility with nonacademic stakeholders. Second, organizational leaders—such as presidents, vice-presidents, and deans—are important in influencing the rules, norms, and processes across campus, mobilizing larger groups within campus, and raising the level of dialogue with industry away from narrow-contract research into forward-looking research partnerships.

One key role of institutional leadership is to deal with controversies concerning relationships with industry. As the ongoing debate about the role of the pharmaceutical industry in US medical schools show, controversies will keep emerging, and institutions will be forced to review its rules around engagement from time to time.

In an ongoing process, only through serious experimentation and, often, controversies can universities develop appropriate organizational policies and structures for their roles in economic development and innovation. ■

## Faculty Perceptions of Governance and Management:

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Academics these days like to hearken back to an earlier era that comprised a reasonable division of labor in higher education decision making, with faculty responsible for academic matters and trustees and managers responsible for financial solvency and external relations. A model of higher education decision making was prevalent with *shared governance* as the cornerstone accompanied by consultative management leading to improved-work faculty performance and loyal-

ty both to fields and institutions. Current trends toward the privatization, marketization, and greater accountability of higher education may have had the effect of undermining the “golden age” compact of shared governance.

To assess faculty perceptions of the current state of higher educational governance and management, the Changing Academic Profession (CAP) project went to the field in 2007 in 18 countries—Argentina, Australia, Brazil, Canada, China, Finland, Germany, Hong Kong, Italy, Japan, Korea, Malaysia, Mexico, Norway, Portugal, South Africa, United Kingdom, and United States. For 8 of these countries, trend data back to 1992 were available from the International Survey of the Academic Profession sponsored by the Carnegie Foundation for the Advancement of Teaching.

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#### SHARED GOVERNANCE

In most of the 18 countries, faculty were more likely to perceive they have authority individually or through academic committees and boards over academic matters such as choosing new faculty, making faculty promotion and tenure decisions, and approving new academic programs. Higher-level bodies (especially deans and department chairs) tended, instead, to decide budget priorities and to select key administrators. Faculty in Japan, Canada, Italy, and Portugal—and to a slightly lesser extent, the United Kingdom, Finland, and the United States—regarded themselves as relatively powerful, whereas faculty in Germany and most of the emerging countries judged themselves to be less powerful. Among the latter category, faculty in China, Malaysia, and Brazil have the least power. When it comes to budgets and administrators, the only anomaly is Mexico, where faculty perceived government and external stakeholders to have more power over these decisions than faculty in any of the other 17 countries.

One measure of shared governance features the extent to which faculty regarded themselves as having personal influence in their institutions. As expected, a relatively high percentage of academics in all countries saw themselves as influential at the department level. This was particularly the case in the United States (65 percent), Canada (60 percent), and Germany (57 percent), as well as Brazil (63 percent), Mexico (61 percent), Korea (58 percent), and South Africa (56 percent). Yet, when the examination of personal influence is extended beyond the department to the level of a faculty or school and to the institution as a whole, the number of countries where fac-

ulty regard themselves as having a high level of personal influence is reduced to four, namely, the United States, Brazil, Korea, and Mexico. Faculty in the United Kingdom, Finland, Norway, and Hong Kong regarded themselves to have a relatively low personal influence at all three administrative levels at their institutions.

#### FACILITIES

Overall, where the level of shared decision making and consultation was high, faculty tended to positively evaluate the quality of their university infrastructure as well as the efficiency of support processes. Among the emerging countries, Mexico is an interesting case where shared decision making was relatively high, as was the faculty’s perception of the quality of their facilities. Among the more advanced economies, Hong Kong stands out with relatively top-down decision making. Yet, the faculty give positive ratings on the quality of their facilities and the efficiency of the support processes.

#### INSTITUTIONAL LOYALTY

In most of the mature systems, less than two out of three academics expressed a positive level of commitment when asked to rate the importance of their affiliation to their institution. In the United Kingdom less than 4 out of 10 expressed this sentiment. This contrasts with several of the emerging countries—like Argentina, Brazil, Malaysia, and Mexico—where between 80 and 90 percent expressed a positive sense of institutional commitment.

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#### CHANGE SINCE 1992

For 8 of the 18 countries, it was possible to compare most of the 2007 findings with those in 1992 (with a similar sampling procedure and identical questions). Despite recent faculty complaints about their sense of powerlessness, the comparison with 1992 would suggest that faculty have as much influence on decision making today as before. Hence, if faculty have lost power, this process would seem to predate the earlier survey. However, a shift in the overall power distribution has occurred, with deans and department chairs achieving a more prominent role in decision making and higher-level bodies, such as the office of the chief operating officer as well as boards of trustees and government ministries, surrendering some authority.

Transitions in the distribution of power (which as noted above have been modest) appear to have little relation to changes in the quality of facilities. In 1992, the more advanced systems had superior facilities, and that positive finding remained so in 2007. The main pattern of change has existed in several of the emerging countries—notably Brazil, Mexico, Hong Kong, and Korea—to raise the quality of their facilities in keeping with the quality of facilities in the more-advanced systems. Indeed, academics in Hong Kong perceive their facilities to be the best in 2007, whereas the Hong Kong ratings were relatively low in 1992. While we have only 13 items available for a temporal comparison, an improvement in the quality of managerial support for teaching appears between 1992 and 2007, though this tendency is less apparent concerning support for research.

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#### DECLINE IN LOYALTY

Perhaps the most striking change over the 1992–2007 period has been the decline in the institutional loyalty of academics, presaged above. In 1992, academics in most of the participating countries indicated a high level of commitment to their academic discipline, department, and institution. In 2007, academics in all countries continue to show a strong sense of commitment to their disciplines. However, 6 of the 8 countries for which panel data are available faculty reveal a somewhat weakened sense of loyalty to their department and a sharp decline in the level of commitment to their institution. For these 6 countries, 9 out of 10 academics express a strong sense of affiliation with their discipline in 2007, while fewer than 6 out of 10 express a strong affiliation with their institution. Correlates of low institutional commitment or loyalty include a perception that the prevailing management style is top-down, a perception that facilities are inadequate and support services too bureaucratic. The emerging countries of Brazil and Mexico are the exceptions, with high levels of institutional loyalty expressed in 1992 and 2007.

The decline in institutional loyalty appears to have consequences. Academics who express low institutional loyalty are more likely to favor research over teaching, more likely to devote a greater percentage of their time to research and a lesser percentage of their time to teaching, and less likely to engage in university service and administrative tasks.

#### IMPLICATIONS

For the higher education systems in the more advanced societies, it may be that a significant minority of academics, demoralized by decision-making processes and what is per-

ceived as an inadequate working environment, are reducing the effort they devote to the required tasks of teaching and routine administration. Thus, these systems may be losing valuable academic energy.

In contrast, in several of the emerging countries shared governance is, at best, weakly practiced. Yet, the strong managers have been able to deliver in terms of excellent facilities and efficient support services. Moreover, academics in these more authoritarian systems give their leaders reasonable ratings as wise decision makers who have created a clarity of institutional mission and have provided competent management. ■

## The Quest for Quality in China's Higher Education

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With a dramatic increase in undergraduate enrollment starting in 1999, China began to enter the mass higher education era in 2002. Given the rising public skepticism about the quality of higher education following the expansion, in 2003 the Ministry of Education launched the Quality and Reform of Undergraduate Teaching and Learning Project, which began to be upgraded and cosponsored by the Ministries of Education and Finance, in 2007.

#### THE QUALITY PROJECT

The quality project has focused on enhancing the quality of undergraduate teaching and learning by means of reforms and resource sharing. It comprises six types of granting programs—including disciplinary-program revamping and specialized accreditation; curriculum, textbook, and resource sharing; teaching and learning and talent-nurturing innovation; instructional-team and eminent faculty-team building; evaluation and public disclosure of general teaching and learning conditions; and support for postsecondary institutions in the western regions of China.

During the 11th five-year-plan period from 2006 to 2010, the central government has planned to spend a total of 2.5 billion RMB (approximately US\$366,241,338) on the aforementioned programs. In addition, both the central and provincial governments have granted a variety of awards and honors in recognition of the contributions made by individuals and teams to teaching and learning reforms. Despite these and many other efforts, it is not clear whether they will yield the