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DIFFERENTIATING AMERICA'S COLLEGES AND UNIVERSITIES:

INSTITUTIONAL INNOVATION IN ARIZONA

BY MICHAEL M. CROW

Michael M. Crow became the sixteenth president of Arizona State University in 2002. He was previously executive vice provost of Columbia University. A fellow of the National Academy of Public Administration, he is the author of books and articles analyzing knowledge organizations and science and technology policy.

Colleges and universities negotiating their recovery from the most severe recession in nearly a century are currently implementing a welter of hastily devised measures aimed at reducing operating costs, becoming more efficient, and restoring a prior equilibrium. But administrators reacting to the downturn should not restrict their focus to the short term, fixating exclusively on cost cutting or reshuffling longstanding priorities. They should instead engage in comprehensive long-range planning that uncovers and fixes “design flaws” and advances new and differentiated models for the nation’s colleges and universities.

The reconceptualization of Arizona State University (ASU) is considered here as a case study of how one university has accomplished such a redesign. As president of ASU, I have led an effort to reinvent the youngest major public research institution in the United States through a comprehensive “design process” that has included both an exhaustive reevaluation of our academic organization and operations and an effort to pioneer what we term the “New American University”—an egalitarian institution committed to academic excellence, access, and maximum societal impact.

Newsweek has termed ASU’s experiment “one of the most radical redesigns in higher learning since the modern research university took shape in nineteenth-century Germany” (August 9, 2008). An editorial from the journal *Nature* observes that questions about the future of the contemporary research university are being examined “nowhere more searchingly than at Arizona State University” (April 26, 2007). Accordingly, we invite scrutiny and encourage critique of the process, since we consider our effort a case study in institutional innovation.

Our objective has been to accelerate a process of institutional evolution that might otherwise have taken more than a quarter-century and compress it into a single decade (2002–2012). Such self-determination has meant embracing transformational change: we have confronted the complexities associated with advancing robust institutional innovation at scale and in real time.

TOWARD DIFFERENTIATION AMONG COLLEGES AND UNIVERSITIES

Differentiation is the process by which nature prospers, offering new prospects to organisms and the potential for species to evolve. The concept applied to organizations and institutions presumes a trajectory of change and adaptation that we term institutional evolution. Its antithesis is “ossification”—a lack of innovation in the organization and practices of our institutions—which too often characterizes academic culture.

Most colleges and universities define themselves in comparison to a set of institutions that comprise the “gold standard” in American higher education: the Ivies, the great land-grant universities, and the elite institutions constructed on the foundation of private fortunes. Private institutions seek Harvardization and public institutions attempt to replicate the patterns established by Berkeley and Michigan; each would do better to seek its own unique identity and situate itself in a synergistic network of collaboration.

The lack of innovation in our colleges and universities results in an insufficient differentiation between distinct categories of institutions as well as a stultifying homogeneity among institutions of the same type. While our nation urgently needs more research-intensive and research-active institutions, both public and private, it also needs more liberal arts colleges, four-year

regional colleges, community colleges, professional schools, technical institutes, and for-profit enterprises focused primarily on workforce training. And institutions of the same type must develop distinctly different competencies if our national innovation system is to remain robust.

While conventional wisdom suggests that all great universities must function equally as centers for humanistic and social scientific scholarship as well as world-class science, engineering, and medical research, not every institution can support a comprehensive spectrum of programs. Institutions must cultivate unique and differentiated research and learning environments that address the needs of students with different levels of academic preparation and differing types of potential. Ubiquitous information technologies provide an important augmentation of the learning environment, but for institutions charged with imparting advanced knowledge and instilling the capacity for critical thinking, these are not substitutes for personalized instruction.

INSTITUTIONAL INNOVATION AND ACCESS TO EXCELLENCE

Here I will focus on the American research university. In his new book on the topic, Jonathan R. Cole, the longtime provost of Columbia University, listed some of the transformational discoveries that originated at our nation's research universities. From lasers to magnetic resonance imaging to global positioning systems to the algorithm for Google searches, he points out, the breakthrough technologies of university-based innovation have improved our quality of life and fostered economic growth. But despite the critical niche that research universities occupy in the global knowledge economy, institutions committed primarily to discovery and innovation restrict the potential of their contribution unless they explicitly embrace a broader societal role.

We take for granted that the fundamental model for higher education in the United States is sound. We mistakenly assume that the intellectual objectives of our institutions, especially in terms of scientific and technological research, are automatically and inevitably aligned with our most important goals as a society. The challenge in this context is to reinvent knowledge-producing enterprises so that they respond to their multiple constituencies and advance constructive social and economic outcomes.

This is an era when learning has become the single most critical adaptive function for individuals in society, and the full

development of each individual is in turn critical for the society as a whole. But while nations worldwide are investing strategically to educate their citizens for the new global knowledge economy, America's educational infrastructure remains unable to accommodate projected enrollment demands. Our leading institutions have become increasingly "exclusive"—that is, they define their excellence through admissions practices based on exclusion. We underperform in providing opportunities for the increasing number of students of all ages, socioeconomic backgrounds, levels of academic preparation, and differing

types of intelligence and creativity seeking enrollment in our colleges and universities.

While our nation's leading universities, both public and private, consistently dominate global rankings, our success in establishing excellence in a relative handful of elite institutions does little to ensure continued national competitiveness, especially when one considers how few students attend those universities. The challenge of providing access to higher education for most Americans thus falls to less selective schools. But the scale and speed of new knowledge production is unprecedented, and with more and more knowledge required for entry into the workforce, university-level instruction several steps removed from the cutting edge of innovation may entail diminished prospects for the individual and a reduction in the standard of living for subsequent generations.

What is required is a new model for the American research university that offers access to excellence to a broad demographic range of students. In order for our nation to achieve the ambitious objectives for educational attainment laid out by President Obama, we must first build a higher education infrastructure adequate to the task.

Without sufficient resources, our schools cannot hope to offer the curricula, programs, student services, and facilities that will produce the graduation rates called for by the President. But while the condition is generally exacerbated by public disinvestment in higher education, we must not attribute lack of innovation primarily to insufficient resources.

AN EXPERIMENT IN INSTITUTIONAL INNOVATION

In its present form Arizona State University is the youngest of the roughly one hundred major research institutions in the United States, both public and private, and—with an enrollment approaching seventy thousand undergraduate, graduate, and professional students—the largest American public research

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university governed by a single administration.

Situated in the heart of the so-called Sun Corridor, an emerging megapolitan area stretching from the Prescott region of central Arizona to the border with Mexico, ASU is the sole comprehensive baccalaureate-granting university in a metropolitan region of four million (projected to increase to eight million). Responsibility for higher education in other large metropolitan regions is shared by a number of institutions. Metropolitan Los Angeles, for example, boasts major research institutions such as UCLA, USC, and Caltech, with four additional UC campuses within close proximity. A number of Cal State campuses and private institutions such as Occidental College, the Claremont Colleges, and Claremont Graduate University fill out the roster. And while the population of Maricopa County is the same as the entire state of Colorado, the latter by contrast boasts the University of Colorado at Boulder; CU Denver, now consolidated with the medical school; CU Colorado Springs; Colorado State University; the University of Northern Colorado; and some noted private institutions such as the University of Denver and Colorado College.

Arizona will continue to experience large increases in its college-age population but boasts an insufficient four-year college infrastructure to accommodate that growth. Our efforts to make operational the vision of a New American University in Arizona were to a large extent shaped by the imperative to accommodate the demands and requirements of the locale—which meant combining academic excellence with broad access, promoting diversity, and meeting the special needs of underserved populations. Meanwhile, with an economy insufficiently diversified to accommodate its population expansion, Arizona is confronted with major challenges associated with the environment, healthcare, social services, immigration, and the performance of P-12 education, all of which place implicit demands on the university's researchers.

While in some measure the initiation of our efforts was inspired by the call for a “new university” issued by Cornell University president *emeritus* Frank Rhodes, the implementation of the New American University model has in practice been shaped through exhaustive trial and error, a number of course corrections, and the application of common sense. As first set forth in the white paper “One University in Many Places: Transitional Design to Twenty-First Century Excellence” (2004, rev. 2009—http://provost.asu.edu/files/shared/presentations/OneUniv_110209.pdf), the objective of the design process has been to build a comprehensive metropolitan research university

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that is an “unparalleled combination of academic excellence and commitment to its social, economic, cultural, and environmental setting.”

Four interdependent university goals are critical to achieving a set of eight “design aspirations,” considered in the following section. The goal of “access and quality for all” recognizes our responsibility to provide a high-quality higher education to all qualified citizens of Arizona. A second goal is the establishment of “national standing for colleges and schools in every field.” The third goal, “becoming a national comprehensive university by 2012,” is intended to build regional competitiveness. The fourth goal enjoins the university to “enhance our local impact and social embeddedness.” While the advancement of the university remains a perpetual process, as of early 2010—more than two years ahead of schedule—we had not only made demonstrable progress but had in fact accomplished these four goals.

Rather than advancing a trajectory model that would guide evolution according to linear extrapolation or a replication model that would attempt to recreate the organization of leading research universities, we chose to develop a distinctive institutional profile by building on existing strengths. The result was a federation of distinctive colleges, schools, interdisciplinary research centers, and departments and a deliberate and complementary clustering of programs on each of four differentiated campuses of equally high quality distributed across metropolitan Phoenix. Predicated on devolving intellectual and entrepreneurial responsibility to the level of the college or school, the model calls for each school to compete for status, not with other schools within the university but with peer entities around the country and world.

More than a dozen new transdisciplinary schools—including such units as the School of Human Evolution and Social Change; the School of Historical, Philosophical, and Religious Studies; the School of Computing, Informatics, and Decision Systems Engineering; and the School of Earth and Space Exploration—complement large-scale research initiatives. These include the Global Institute of Sustainability (GIOS), which incorporates the first-of-its-kind School of Sustainability, and the Biodesign Institute, a large-scale multidisciplinary research center dedicated to biologically inspired innovations in healthcare, energy and the environment, and national security. As described by our provost, Elizabeth Capaldi, in a previous issue of *Change* (July/August 2009), in the process we have eliminated a number of traditional academic departments, including biology, sociology, anthropology, and geology.

ARIZONA STATE UNIVERSITY CAMPUSES

Business	Design & the Arts	Teacher Education	Engineering	Public Programs
Graduate	Honors	Journalism	Law	Sustainability
Letters & Sciences	Liberal Arts & Sciences	New College	Nursing & Health	Technology & Innovation

Downtown campus

Walter Cronkite School of Journalism and Mass Communication
 School of Letters and Sciences
 College of Nursing and Health Innovation
 College of Public Programs
 Mary Lou Fulton Teachers College
 Graduate College
 Barrett, the Honors College

Tempe campus

W. P. Carey School of Business
 Herberger Institute for Design and the Arts
 Ira A. Fulton Schools of Engineering
 Graduate College
 Sandra Day O'Connor College of Law
 School of Letters and Sciences
 College of Liberal Arts and Sciences
 School of Sustainability
 Mary Lou Fulton Teachers College
 Barrett, the Honors College

Polytechnic campus

Morrison School of Management and Agribusiness (W. P. Carey School of Business)
 School of Letters and Sciences
 College of Nursing and Health Innovation
 Mary Lou Fulton Teachers College
 College of Technology and Innovation
 Graduate College
 Barrett, the Honors College

West campus

W. P. Carey School of Business
 New College of Interdisciplinary Arts and Sciences
 Mary Lou Fulton Teachers College
 Graduate College
 Barrett, the Honors College

As evidence of the model's viability, we note that during the past six years our research enterprise more than doubled its expenditures, surpassing the \$300 million level for the first time in FY 2009. Estimates for FY 2010 expenditures exceed \$370 million. ASU is one of only a handful of institutions without either an agricultural or medical school to have surpassed the \$200 million level in funding, with institutional peers in this category including Caltech, MIT, and Princeton.

In terms of competitive funding, ASU now ranks among the top 20 leading research universities in the nation without a medical school, according to the National Science Foundation, and for the third consecutive year it has been ranked as one of the top 100 universities globally in the international assessment conducted by the Institute of Higher Education, Shanghai Jiao Tong University, placing 94th in their 2009 *Academic Ranking of World Universities*. To provide some perspective on the momentum of the trajectory, ASU conducted no significant funded research prior to 1980.

The faculty roster includes growing numbers of recipients of prestigious national and international honors. More members of the National Academies have joined our faculty during the past six years than have served on the faculty during the past five decades, and among our ranks we now count three Nobel laureates.

Similarly, ASU has made remarkable progress in the academic profile of its student body. The fall 2009 freshman class numbered 9,344, with 31 percent in the top 10 percent of their high school class. While ASU awarded a record 15,610 degrees in AY 2009, up 38 percent since the end of FY 2002, the university's five-year graduation rate increased by almost 9 percent and now exceeds the average for all US public universities by more than 12 percent. ASU is one of the top 10 producers of Fulbright Scholars in the nation, and in fall 2009 boasted 613 National Merit Scholars, placing ASU among the top 10 public universities nationally. The number of National Merit Scholars has increased 61 percent since 2002.

At the same time, we reject the notion that excellence and access cannot be integrated within a single institution, and we have sought to redefine the notion of egalitarian admissions standards by offering access to as many students as are qualified to attend. Our keystone initiative in this context is the President Barack Obama Scholars Program, which ensures that in-state freshmen from families with annual incomes below \$60,000 are able to graduate with baccalaureate degrees debt free. During fall semester 2009, more than 1,700 freshmen participated in the program. President Obama has asked other colleges and universities across the nation to follow ASU's lead in providing this type of program.

The Obama Scholars Program epitomizes our pledge to Arizona that no qualified student will face a financial barrier to attending ASU. It also underscores the success of the long-standing efforts that have led to record levels of diversity in our student body. While the freshman class has increased in size by 42 percent since 2002, for example, enrollment of students of color has increased by more than 100 percent. And from FY

2003 through FY 2008, the enrollment of low-income Arizona freshmen increased by 873 percent.

DESIGN ASPIRATIONS

The design aspirations guiding the reconceptualization call for the university to

- respond to its cultural, socioeconomic, and physical setting;
- become a force for societal transformation;
- pursue a culture of academic enterprise and knowledge entrepreneurship;
- conduct use-inspired research;
- focus on the individual in a milieu of intellectual and cultural diversity;
- transcend disciplinary limitations in pursuit of intellectual fusion (transdisciplinarity);
- embed the university socially, thereby advancing social enterprise development through direct engagement; and
- advance global engagement.

These aspirations are inherently interrelated. For example, our response to the unique challenges associated with the setting of the university and the demographics of the American Southwest inform the recommendations that we respond to our locale, transform society, enable student success, and advance social embeddedness. The aspiration to value entrepreneurship conceptualizes academic enterprise as the spirit of creative risk-taking in all fields through which knowledge is brought to scale to spur social development and economic competitiveness.

The interaction between the design aspiration of intellectual fusion and sustainability is representative of the interplay's dynamics. Intellectual fusion seeks to transcend the limitations of traditional discipline-based departmental organization. Entrenchment in disciplinary silos undermines the capacity of our institutions to address the grand challenges—one need only think of hunger and poverty, global climate change, the extinction of species, the exhaustion of natural resources, and the destruction of ecosystems. A response commensurate to these intractable problems requires that we advance research that can provide us with the means to balance wealth generation with continuously enhanced environmental quality and social well-being.

With the establishment of the Global Institute of Sustainability (GIOS) in 2004 and the School of Sustainability (SOS) three years later, ASU has consolidated its position in the vanguard of interdisciplinary research on sustainable development. GIOS researchers include life scientists, social scientists, engineers, humanists, and legal scholars collaborating with policymakers and leaders from business and industry.

With a special focus on the complex interactions between urban environments and natural systems, GIOS researchers and practitioners advance knowledge and seek practical solutions in areas as diverse as agriculture, air quality, marine ecology, materials design, nanotechnology, policy and governance, renewable energy, risk assessment, transportation, and urban infrastructure. Collaboration in sustainability initiatives engages premier insti-

tutions around the world, including Stanford, Harvard, MIT, the University of Washington, Tec de Monterrey, and Cambridge.

Meanwhile, the School of Sustainability offers both undergraduate and graduate degree programs. The school is educating a new generation of leaders through collaborative, transdisciplinary, and problem-oriented training that addresses environmental, economic, and social challenges such as rapid urbanization; water quality; habitat transformation; the loss of biodiversity; and the development of sustainable energy, materials, and technologies.

While GIOS remains our front line of engagement in sustainability, we are also engendering an institutional culture of sustainability. ASU offered sustainability-themed courses in twenty-five subject areas during the past academic year, including anthropology, architecture, biology, economics, engineering, industrial design, law, philosophy, nonprofit leadership, and urban planning.

A further objective is to engage the community in supporting sustainability initiatives, including widespread reductions in greenhouse gas emissions. ASU is committed to reducing its energy consumption, increasing efficiency, and minimizing harmful emissions related to energy consumption.

The university has invested heavily in energy efficiency across all campuses, saving an estimated 33 million kWh and 70 million pounds of CO₂ annually. Since 2005 ASU requires, to the fullest extent practicable, Leadership in Energy and Environmental Design (LEED) Silver certification for all new construction of university-owned and operated buildings. The university-wide solar initiative has already installed 2.04 MW of photovoltaic power on the Tempe campus, providing 7 percent of the campus's electric demand, and a 4.65 MW solar installation is underway on the West campus. Plans call for 10 MW of solar power capacity by the end of 2010 and 20 MW at the end of future phases. These efforts helped advance the university's carbon-neutral goal and reaffirmed its leadership position in the American College and University Presidents Climate Commitment.

TOWARD A NEW AMERICAN UNIVERSITY

The elite universities and colleges in our nation, both public and private, have established and maintained a gold standard for higher education that others feel compelled to emulate, but

institutions today must overcome their identification with this historical model of elitism and isolation from society. While the genetic code of the first universities to emerge in medieval Europe is still present in the interstices of Arizona State University, as a New American University situated in the heart of the American Southwest in the twenty-first century, ASU must address the needs of its region even as it seeks solutions for global challenges.

We have sought to rethink the institution from the ground up.

And by establishing new criteria for success, we have chosen to redefine the terms of our competition with institutions that have matured over the course of centuries. Although ASU traces its origins to a territorial teachers college in the nineteenth century, its trajectory as a comprehensive research university did not begin until 1958. So despite having been shaped by the organizational principles and practices of the past, ASU refuses to be determined by them: ASU does not seek Harvardization.

While all public research universities are committed to teaching and discovery, there is no reason why each cannot advance unique and differentiated research and learning environments that address the needs of their particular region. In ASU's case, our reconceptualized mission requires that we embrace fundamental change, and in so doing, pioneer

a model for the American research university that recovers the egalitarian tenets of the true public university.

During the past several decades, academic culture in our nation has been characterized largely by self-satisfaction arising from steady progress by the top research universities. But in a keynote address to the American Council on Education, Gordon Gee, president of Ohio State University, expressed with particular eloquence the imperative for the "radical reformation" of our colleges and universities: "The choice, it seems to me, is this: reinvention or extinction."

Such change is clearly essential, but we are nowhere near the broad consensus or collective sense of urgency that would transform analysis into action. In this new era of dramatically escalating complexity, the question remains yet to be resolved whether American universities can adapt fast enough to meet the challenges of the global economy in the twenty-first century. □

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