

• The complexity of the challenges that confront American colleges and universities demand their further evolution. There are institutions that even today look very much like the elite colleges of colonial New England, and others remain entrenched in their 19th-century configurations.

• The vision for Arizona State University is to establish it as a model for a New American University measured not by who it excludes, but rather by who it includes; pursuing research and discovery that benefits the public good; and assuming major responsibility for the economic, social, and cultural vitality and health and well-being of the community.

• Access to excellence for a broad demographic is foundational to ASU's vision. To revive the social compact implicit in American higher education, ASU implemented admissions policies similar to those of UC Berkeley in the 1950s and 60s, when graduating California seniors who had completed a set of 10 required courses with a 3.0 GPA could expect to be automatically admitted to the state's flagship public institution.

• A daunting barrier in pursuing ASU's vision was the obsession, shared by nearly all universities, with positional rankings. Once constituencies were convinced that the rankings game was of no value in pursuing ASU's objectives, it was possible to adopt a differentiated vision focused on ASU's primary responsibilities to its students, community and society.

Reinventing the Public Research University

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The United States has the fastest growing population of the industrialized nations and at the same time is experiencing the steepest declines in the educational attainment of its citizens. Demographic transitions, slow economic growth, and societal problems including healthcare, social services, the performance of P-12 education, and the environment present a complex set of challenges that American colleges and universities can play a key role in addressing. Michael M. Crow, president of Arizona State University (ASU), describes his vision for a New American University that assumes responsibility for the economic, social, and cultural vitality and well-being of its community. He notes the rapid growth of ASU, where total student enrollment now exceeds 72,000, and emphasizes that the model for the New American University is to be measured not by those whom it excludes, but rather by those whom it includes. Crow also describes several cost-saving measures adopted by ASU, including the use of new learning technologies for introductory-level classes that improve outcomes as well as cut costs, advanced statistical evaluation, or analytics, and an interactive advising system that improves retention rates. Excerpts of Crow's remarks at the Forum's 2011 Aspen Symposium are reprinted here.

Before we consider Arizona State University as a case study in the reconceptualization of a large public university, I would like to begin by talking about educational success and economic competitiveness in our nation. In terms of population, more than 311 million people call our nation home, and the United States is the fastest growing of the industrialized nations. With regard to the scale of demographic change, consider that there are more people of Hispanic origin living in the United States today than the total number of Americans alive during the Civil War—more than 50 million. As the third most populous nation on the planet, we're on a fast-track trajectory to attain a population of 400 million or, by some estimates, 450 million. Eighty percent of this populace is projected to live in ten rapidly evolving megapolitan regions; Phoenix is at the center of the so-called Sun Corridor megapolitan. The

stresses and strains from this growth are considerable. More capital investment will be required in the next 50 years than in all of the previous years of our republic just to maintain our standard of living at present levels. That means the construction of roads, bridges, houses, airports, schools, colleges, and universities—and all the other components of our national infrastructure.

The United States has seen the steepest decline in educational attainment of all the industrialized nations. I won't parse the numbers but the outlook is not promising. National decline in educational attainment may be less apparent from the perspectives of private colleges and universities, but for standard issue, generic public universities, graduation rates are presently below 40 percent. The graduation rate for community colleges is even more alarming: under 20 percent in most cases and under 10 percent in

many cases. And so we have a strange confluence of factors—the fastest growing industrialized nation with the steepest declining educational attainment. Yet we are probably the most creative of nations and we certainly have witnessed astonishing increases in productivity. Nonetheless, our economy is struggling to find a path to 3 percent annual growth.

Consider the challenge at the macro-level. President Obama outlined the critical elements of a pathway to success for our country in early 2009. He said quite clearly that in order for our nation to be successful, America must once again have the highest proportion of college graduates in the world. He has also stated that we must resume our leadership in math, science and engineering. I had occasion to spend some time with the President when he visited our campus, and we ran some numbers on the back of an envelope in an effort to determine what it would take to reach those educational attainment objectives. We considered the readiness of our community colleges and public and private colleges and universities and for-profits. My sense is that American academia may certainly be capable of achieving these goals, but we are far from being ready to do so.

The complexity of the challenges that confront our colleges and universities demand their further evolution. An oversimplified model would trace their origins to the academies in ancient Athens, which were small in scale and conservative in the sense that their pursuit of knowledge implied no risk. The medieval European universities broadened their engagement with society, and in the seventeenth century gradually incorporated the research orientation of the German scientific institutes. The United States imported that model and in the late nineteenth century the American research university assumed its present contours, influenced by the utilitarian mandate of the land-grant institutions. In terms of scale and purpose and orientation, the American research university represented a differentiated model from the elite colonial colleges that preceded it.

My point is that colleges and universities operate in an evolutionarily complex arena, just like any other organizational type. At the same time, there are American institutions that even today look very much like the elite colleges of colonial New England, and others that remain entrenched in their 19th-century configurations. Consider the process of institutional evolution in the broader context of the United States as a developing democracy—at the end of the day it is a place of massive, tumultuous forward progress, with fits and starts, and successes and failures. Evolutionary forces are at work and cities are being built even as we speak. We think of China as epitomizing massive change, but it is happening here as well.

The population of Arizona currently exceeds 7 million, representing a ten-fold increase since 1950. But even this

figure is certainly not its growth trajectory endpoint. The most conservative projections suggest that within the next four or five decades the population will exceed 10 or even 12 million, and Arizona will become the eighth or ninth largest state. This is especially alarming when one considers Arizona's limited educational infrastructure. Further, Arizona's diversity index is increasing even more rapidly than the growth rate, bringing with it serious social stresses. The state confronts major challenges associated with immigration, healthcare, social services, the performance of P-12 education, and the sustainability of its environment. Our efforts to operationalize a New American University in Arizona were to a significant extent determined by the imperative to accommodate the requirements of a region characterized by potentially disruptive demographic transition, and an economy insufficiently diversified to accommodate explosive population growth.

A Vision for A New American University

At the time of my inauguration at ASU in 2002, we articulated a vision for a New American University, which derives in part from the work of a number of academic leaders, including Frank Rhodes and Jim Duderstadt, and thinkers whose work has contributed to the overall logic about what a public university should represent. We outlined a vision for Arizona State University that at first glance may seem no more than rhetoric:

To establish ASU as the model for a New American University, measured not by who we exclude, but rather by who we include; pursuing research and discovery that benefits the public good; and assuming major responsibility for the economic, social, and cultural vitality and health and well-being of the community.

While many institutions may make similar claims, we operationalized the vision with the intent to demonstrate transformational societal impact that exceeds the efforts of peer institutions. Our mission, as we have conceived it, is to build a comprehensive metropolitan research university that is an unparalleled combination of academic excellence and commitment to its social, economic, cultural and environmental setting. Excellence, access and impact are thus integral to our mission.

Access to excellence for a broad demographic is foundational to this vision. With elite universities limiting enrollment to the topmost few percent of graduating high school classes, the broad access to quality higher education that once could be taken for granted is now flatly denied the majority of qualified applicants. While some may argue on behalf of this sort of meritocracy, I contend this represents an abdication of social



responsibility. In order to revive the social compact implicit in American higher education, ASU decided to implement admissions policies similar to those of UC Berkeley in the 1950s and 60s, when graduating California seniors who had completed a set of ten required courses with a 3.0 grade point average could automatically expect to be admitted to the state's flagship public institution.

What we refer to as our "design process" sought input from within the institution, institutional peers, the general public, and a range of others. Inasmuch as ASU is the sole comprehensive research university in a metropolitan region of more than 4 million people, we determined that there was no historical institutional model for us to attempt to emulate. Our campuses are located in Maricopa County, which is the third-most populous county in the United States, behind Los Angeles County and Cook County in Illinois. Large public universities that are institutional peers—Minnesota, Texas at Austin, Ohio State—follow a similar model, but the demographics in Arizona demanded a unique response.

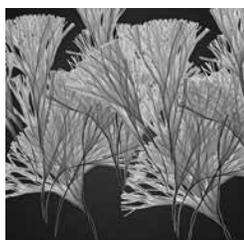
ASU is the nation's youngest major research institution and, with enrollment exceeding 72,000 undergraduate, graduate, and professional students, the largest university governed by a single administration. ASU awarded more than 17,000 degrees in FY 2011, up 51 percent from FY 2002. The fall 2010 freshmen class numbered more than 9,500. Students from diverse ethnic backgrounds made up 39 percent of the class. Since 2003, ASU has added roughly 25,000 students to its base of enrollment. Since fall 2002, minority enrollment as a percentage of total student population increased by 44 percent to 30 percent of the total student body. The number of African American students increased by 95 percent, and Hispanic students increased by 88 percent. And we have made major progress in delivering on our promise that no Arizona student will be denied access to a quality college education because of lack of financial means. First-time freshmen Pell Grant recipients increased 146 percent from FY 2003 to FY 2010. Since 2002, the university has moved from a model of low-tuition/low-access to a moderate-tuition/high-access approach. As a result, when calculated according to federal poverty guidelines, from FY 2003 through FY 2011, the percentage increase of first-time, full-time low-income Arizona freshman was 647 percent.

It may be counterintuitive, but we have proven that it is possible to maintain a culture of rigorous academic excellence despite enrollment growth by implementing new learning and assessment tools and deploying new learning technologies. Other measures include faculty expansion and the development of differentiated residential learning environments. To promote access to excellence despite the challenges of enrollment demand, we adopted a distributed model, operating from four differentiated campuses of equally high aspiration, with each campus representing a planned clustering of related but academically distinct colleges and schools. We term this empowerment of colleges and schools "school-centrism," which bears resemblance to the University of London, which is a federation of twenty autonomous institutions, each advancing differentiated modalities and aspirations.

With 30,000 undergraduate majors in the liberal arts and sciences, for example, ASU operates from multiple teaching and learning platforms, each of which share core principles. With 2,000 English majors and 1,200 chemistry majors, maintaining standards of excellence demands innovation. Since 2008 we have witnessed a 50 percent increase in community college transfers. In August we will welcome roughly 10,000 new freshmen and 7,500 new community college transfer students. But despite burgeoning enrollment growth, public disinvestment in higher education in Arizona continues. The cumulative impact of historic reductions in state funding has been significant. During the past two years, public support has been reduced by over 50 percent per student while at the same time we have improved retention and graduation rates and the quality of our graduates.

The six-year graduation rate for the freshman cohort entering 2004 was 58.7 percent, 19 percent higher than for the cohort that entered a decade earlier, and almost 13 percent higher than the average for all public universities in the United States. Freshman persistence in fall 2010 increased to 84 percent, 9.5 percent higher than in fall 2002.

While our principal mission is to educate the students of Arizona, our research enterprise has advanced critical research in such strategic areas as earth and space exploration, sustainability and renewable energy, advanced materials, flexible electronics, healthcare, national security, urban systems design, and STEM education. During FY 2011, research-related spending exceeded a record \$343 million, a near tripling



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from \$123 million in FY 2002. Among U.S. universities with research portfolios exceeding \$100 million in expenditures, ASU was the fastest growing research enterprise over the past five years, according to the National Science Foundation. Along with Caltech, MIT, and Princeton, ASU is one of only a handful of institutions without either an agricultural or medical school to have surpassed the \$200 million level in research expenditures. In terms of competitive funding, ASU now ranks among the top 20 universities in the nation without a medical school, according to the National Science Foundation. Inasmuch as we seek to assume responsibility for economic, social and cultural vitality to the extent that we can, we encourage research that benefits societal well-being. And so the argument here is for a differentiated vision—not a model for every institution but certainly for those that seek to serve the nation.

ASU Design Aspirations

From the outset ASU outlined eight interrelated design aspirations to guide the reconceptualization of the university, including calls for the academic community to:

- engage ASU's 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 transdisciplinarity;
- embed the university socially, thereby advancing social enterprise development through direct engagement; and
- advance global engagement.

Our first design aspiration, which we refer to as “leveraging place,” calls for the institution to embrace its setting in 21st-century Arizona in order to address the needs of our metropolitan region and, more broadly, Arizona and the Southwest. Chief among these needs, both regionally and globally, is sustainability. Knowledge and outcomes related to sustainability must be framed in terms of specific geographies. With its semi-arid climate, fragile topography, and rapid urbanization, few settings could be more challenging than metropolitan Phoenix. Leveraging place means a commitment to where your institution is situated; in our particular case, leveraging place entails advancing a model that many people think is unattainable, that is, offering the highest levels of academic excellence to a very broad cross-section of students. If we were to present an excellence-only model, the first thing that we would have to do is cap enrollment, which would mean

decreasing the proportion of historically underrepresented groups, including students of color and students from socioeconomically disadvantaged families.

Another design aspiration refers to transforming society, which from our perspective means conscious awareness of institutional responsibility for societal well-being. Our objective is to demonstrate transformational impact that exceeds the efforts of peer institutions. While I could elaborate on any aspect of our teaching, research, and public service, our determination to impact society is epitomized by the advancement of the newly reconstituted Mary Lou Fulton Teachers College, which takes place in the context of our overall efforts to promote access to students from diverse and previously underrepresented socioeconomic backgrounds. ASU traces its lineage to a territorial teaching academy established in 1885. The institution did not even grant degrees until 1925, and then only in education until 1960, and no significant sponsored research was performed at ASU until the 1980s.

Teachers College brings nationally ranked research to outstanding teacher preparation and is dedicated to bringing Arizona schools and students to the forefront of academic achievement. A signature program is the Learning Sciences Institute (LSI), which provides opportunities for faculty to advance the scientific understanding of pedagogy and to engage in the design, implementation and evaluation of learning innovations. The institute promotes interdisciplinary research from a variety of perspectives, including the life sciences, cognitive science, psychology, and engineering. At a time when both the economic competitiveness of Arizona and our continued national scientific and technological dominance are undermined by poor student performance in mathematics and science, and interest in science and technology-based careers is flagging, ASU has redoubled its commitment to promote excellence in K–20 science, technology, engineering, and mathematics (STEM) education.

Inasmuch as the New American University seeks to exert direct impact on society, the design aspirations correlate with our intent to advance innovation and economic competitiveness through “academic enterprise,” by which we mean both an entrepreneurial approach to discovery and innovation and the creative expression of intellectual capital. Our usage of the term “entrepreneurial” within the context of an academic enterprise means the self-directed and creative expression of intellectual capital as a new driver of knowledge-centric change. At ASU we consider entrepreneurship the process of innovation and spirit of creative risk-taking through which the knowledge and ideas within the university are brought to scale to spur social development and economic competitiveness. ASU is committed to embedding the paradigm of entrepreneurship into the fabric of our institutional culture through

a supportive infrastructure of resources to inspire students, faculty and staff, and provide them with the necessary skills to turn their ideas into reality.

In an academic culture that regards knowledge as an end in itself, the social outcomes of research are not always considered. But the complexity of the challenges that confront us makes it essential that we balance ongoing basic research with research focused on addressing actual and immediate problems. Prestige attaches to the discovery of new knowledge, but we might also consider the social implications of our research and harness academic research for maximum societal benefit. This approach to scholarship could be termed “use-inspired” and is thus another of our design aspirations. When Louis Pasteur conducted research in fundamental biology, his concern was also to solve a particular problem. He knew people were dying from drinking water and milk, but he didn’t know why. Having discovered that microorganisms were the cause of fermentation, he realized that they could also cause contagious diseases. Pasteur devoted his late career to the development of vaccines that have protected millions from disease. This approach to scholarship epitomizes use-inspired research, and undergirds the Biodesign Institute at ASU, a large-scale array of ten research centers dedicated to biologically-inspired innovation in healthcare, energy and the environment, and national security.

The design aspiration focused on student success is epitomized by our differentiated learning platforms. ASU has more than one platform for engineering education, for example. In addition to the Ira A. Fulton Schools of Engineering, we have advanced the College of Technology and Innovation on our Polytechnic campus, which offers students interested in direct entry into the workforce an experiential learning environment. We are thus advancing two differentiated schools of engineering, one focused on research and the theoretical aspects of technology, and the other on practical application.

Another aspect of our focus on student success comes with the arrangements for seamless transfer from community college districts in Arizona and Southern California, which provides access for students who might otherwise never have considered application to the university. A surprising number of students in community colleges qualify for admission even to upper-tier institutions but never consider the option because of financial concerns or cultural issues. According to one study, if a student is university-qualified but enrolls in a community college, his or her chances of ever attaining a bachelor’s degree are 15 percent. This represents not only loss of opportunity for the individual but also the diminishment of societal prosperity.

Transdisciplinarity is another critical design aspiration, which we sometimes term “intellectual fusion.” Unlike conventional institutions, we encourage the reorganization of

academic units to facilitate research in order to tackle important societal problems. The transcendence of the disciplinary silo mentality is especially relevant to the advancement of use-inspired knowledge to advance sustainable development. Re-configuration of discipline-based departmental silos maximizes opportunities for transdisciplinary research and enables ASU to leverage particular strengths trans-institutionally, through networks and the development of ties with business, industry and government, which in turn invigorates our national innovation system. In the process we have eliminated a number of traditional academic departments, including sociology, anthropology, geology, and several in various areas of biology.

Our design aspiration specifying social embeddedness is so critical to our mission that we have launched 1,100 outreach programs directly connected to the community involving over 40,000 of our students. The concept conveys our comprehensive approach to public service and the broad extent of the university’s commitment to the social, economic, cultural and environmental well-being of the community and region. ASU drives social change forward by focusing on local school districts, and working, for example, in collaboration with University Public Schools, Inc., a nonprofit enterprise committed to increasing student achievement through which we operate a number of schools. We launched our first prototype elementary school in 2008. Students from all backgrounds are welcome in our schools, including low-income families and immigrant households where English is not the primary language.

ASU focuses on underserved communities, with initiatives that enhance family stability and the quality of place in the metropolitan region. Through the Family and Human Dynamics Research Institute, for example, ASU scholars focus on the structures and processes that impact daily life for children and families. We forge alliances between scholars from the social, behavioral and health sciences and community partners and policymakers so that research will be directly applicable to professional practice and social policy. The ASU Stardust Center for Affordable Homes and the Family, to mention one example, helps communities build quality and affordable homes for a range of household incomes. Through social enterprise development, which leverages the contributions of nonprofits through the business acumen of the private sector, we are contributing to the economic development of the many diverse communities of the metropolitan area. When it comes to societal engagement, we believe that the main obstacle is not resource constraints, but rather lack of creativity and innovation.

Our imperative for global engagement encourages trans-cultural teaching and research and fosters transinstitutional collaboration with academia, business and industry, and

government agencies worldwide. Even service to local communities can have global implication: by scaling local solutions for global impact, ASU develops prototypes for programs and practices with application throughout the world. Like any major research institution, we strive to facilitate scholarly and scientific exchange under the assumption that it advances knowledge as well as the global agenda of the nation. But through what we term “mutual” or “reciprocal” learning opportunities, we focus on the production of knowledge with mutual benefit for both institutional partners.

In Mexico, for example, we are launching major joint sustainability initiatives with the Instituto Tecnológico de Monterrey, or Tec de Monterrey. In China, ASU has brought the prototype of the Decision Theater, a seven-screen immersive environment developed for the visualization of three-dimensional complex multivariate relationships, to a number of universities where it is useful to scientists and policymakers for the analysis of environmental data and modeling simulations. In collaboration with the government of Vietnam, the Higher Engineering Education Alliance Program, or HEEAP, brings the Fulton Schools of Engineering together with Intel and Siemens and other industry partners to improve the quality of the Vietnamese higher education curriculum, which in turn supports the country’s growing high-tech industry.

Conclusion

While our overarching commitment is to provide the best possible education for the students of Arizona, ASU represents a new paradigm for the solution-focused research university of the future. We are determined to be of ever-greater service to our nation and the world, and to mount responses commensurate with the scale and complexity of the challenges that confront us. The vision behind the New American University calls for institutions to develop their own unique institutional profiles. Each must advance a differentiated profile, determined by the setting of the institution, the character of its academic community, and the scope of its constituent colleges, schools, departments, programs and initiatives, including public service and community engagement. This is a pivotal moment to develop innovative models for improving education at all levels and for increasing access to higher education for all Americans.

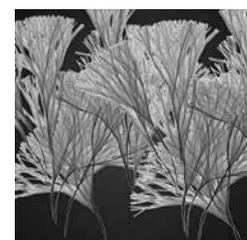
Discussion

Q: Can you talk to us about the most daunting barriers that you had to overcome in this effort? And what kind of tools were the most useful in overcoming those barriers?

Mr. Crow: Interestingly, the most daunting barrier was the fact that all universities are obsessed with where they are relative to others in the positional line. So the hardest thing was convincing people that that was a game of no value to the objectives that we were going to try to achieve. That game, in and of itself, was of no value. If you are able to convince them of that, then you have to step up to, if that’s not the game, then what is the game?

The game—our vision, if you will—was to articulate a differentiated vision and to allow people to be comfortable with that and to convince them that we could be powerfully success-

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ful with our primary responsibilities. Our primary responsibilities this year will be 58,000 undergraduates and 15,000 graduate students, and to impact the community in the way that I’ve been describing. If that is our responsibility, how can we build an institution deeply committed to providing a rich, rigorous, demanding, all-in immersion learning experience? How could we possibly build that with the resources that we have and at the scale that we face? That, of course, is the challenge, but over the course of about two years we were able to convince people that that was a worthy and achievable objective.

We started out a bit slowly by picking a few things that we thought were attainable and a few areas where we thought we could show some fast examples of change. That catalyzed others to move in new directions. But the catalytic effect was slowed down at first by a lack of trust. Trust had to be derived by working with the faculty in creative and dynamic ways and letting them own their designs for change. We didn’t design any changes; we created the environment in which they could be designed.

Q: You said that when you started this transformation, you and others decided to step out of the rankings game, or at least not be driven by where ASU is relative to other universities that you would consider your peers. Do you think ASU has been harmed in the rankings by that decision?

Mr. Crow: Yes. We worry about it because we get the hell beat out of us in the rankings game for different decisions that we’ve made. But after a while, you become immune to that and you see that you’re making progress anyway.

We’ve identified about 150 output indicators, like how many of our kids went into the Peace Corps? How many of

our kids won Fulbrights or won Trumans, or won this or won that? Or how many went on to graduate school, and other places? We've lined up all 150 of those output rankings. My obsession now is that we will be in the top 20 of every one of those. We're eighth right now in Fulbrights, and that's good. We're eighteenth in Peace Corps volunteers. It doesn't make any difference what our ranking is—it's those output rankings that we're very interested in.

We don't do as well as we might do in input rankings because, for example, one of the things that I should have mentioned is that the total resources available to us on a per student basis, even with unavoidable tuition increases—we've increased our tuition from \$2,300 to \$9,200 a year, with a greatly increased commitment to financial aid—are dramatically less than they were.

We've made considerable cuts and changes and adjustments. We eliminated 38 academic departments—history, sociology, anthropology, political science, geology—they don't exist as departments anymore; they exist as programs within larger reconfigured academic units such as “schools,” but not as departments. They're being administered on a completely different basis. We saved those costs, but we get ranked by how many dollars we spend per student, when our objective is to spend less—and at the same time achieve better outcomes.

Q: Can you tell us more about ASU's cost saving measures and how you're dealing with cuts in state funding?

Mr. Crow: We've been dealing with the budget adjustments by making really hard decisions. We don't take a long time to make decisions; we can't. We exited \$15 million in academic administrative costs by restructuring into units that we believe are potentially academically superior and, in some cases, are superior.

We've also been lowering our costs by implementing technology. For example, we've had a huge challenge with freshmen English and freshmen math. Imagine with 10,000 freshmen, it's very expensive to teach 240 sections of freshmen English or x number of sections of freshmen math. We've found ways through technology, particularly on the math

side, to improve our outcomes and lower our costs dramatically. Once we were successful with that on a prototype basis, we've pulled every throttle that we have, every penny that we have, and are investing millions of dollars into these technology tools that we think are now capable enough.

We've spent \$5 million on a system called eAdvisor, which is an interactive tool that allows our students to always know where they are, and to model the effects of changing their major, and to try various scenarios of their movement through the university. At the same time we've hired more academic advisers. The target for freshmen retention at UT-Austin is 90 percent, and so we've set our target at 90 percent. Next year, we'll be at about 86 percent. Our student body is less selective than their student body, but we've set the target at that level. We'll get there by making these tremendous investments in the tools that help students to be successful as they're transitioning that freshman year.

The effects in this area have been the biggest revelation to us—resulting in unbelievable cost savings. We're also making changes relative to the semester system, changing the academic calendar, and doing all kinds of other things that we believe will help us hit higher levels of academic performance, as measured by whatever outcome you want to measure, and helped by the infusion of these massive technological tools that we have found work in the environment that we operate in.

● **MICHAEL M. CROW** is president of Arizona State University, a position he has held since 2002. During his tenure, ASU has established interdisciplinary research initiatives such as the Biodesign Institute, the Global Institute of Sustainability (GIOS), and more than a dozen new interdisciplinary schools. ASU also has dramatically expanded its academic infrastructure and student body, and tripled its research expenditures. Crow was previously vice provost of Columbia University, where he oversaw Columbia's research enterprise and technology transfer operations. He is a fellow of the National Academy of Public Administration and a member of the Council on Foreign Relations. Crow can be reached at michael.crow@asu.edu.