The Next Generation University

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New America Foundation

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Introduction

In the mid-1950s Florida officials, concerned about the future of public higher education in their fast-growing state, created a task force to study the issue. In its report, the task force estimated that by 1970 the Sunshine State would need to accommodate three times the number of its current college students. While the panel envisioned new universities cropping up around the state to meet the demand, they also predicted the state's three existing institutions would need to double their enrollment to 40,000 students. The projections alarmed members of the task force. How could the University of Florida, Florida State University, and Florida A&M University grow quickly in "so short a time without some jeopardy to the quality of programs?"[1] In the minds of the task-force members, there was a limit to the size of a public university and they were quickly on their way to reaching it.

It would be another decade before Florida Technological University opened in Orlando—its mission to train employees for NASA's Kennedy Space Center 35 miles to the east. From under 2,000 students at its start, FTU (now known as the University of Central Florida) evolved over the next 50 years to become the second largest university in the country with 60,000 students, 212 degree programs, and a vast 1,400-acre campus with 180 buildings.[2]

Like other long-time employees at the University of Central Florida, its current president, John C. Hitt, measures his tenure by UCF's enrollment when he started in 1992: 20,000 students. "We've grown, but our goal was never to be big," Hitt says. "We've grown to offer access and opportunity to qualified students, and we won't stop until we can't do that any longer."[3]

To serve an immense and diverse student body and help students graduate in a timely manner, the university rapidly adopted the idea of offering classes in a variety of formats. Today, six in ten students at Central Florida take online or hybrid courses (combination online and face-to-face), which offer them and the institution more flexibility in scheduling and the chance for more personalized learning. The university has 10 locations throughout the crowded Orlando region, each geared toward specific academic disciplines that have forged partnerships with the local industries and governments. And some 25 percent of UCF's juniors arrive at the university on a direct path from Valencia College, a two-year community college across town.

But campuses on the scale of the University of Central Florida are the exception rather than the rule in American higher education. While the philosophy on Wall Street is that growth is good, within higher education the opinion of the Florida task force a half-century ago still largely holds sway: increased size comes at the expense of academic quality and prestige. As a result, even as demand is increasing, public universities are restricting access by becoming more selective in their admissions policies, recruiting more out-of-state students instead of in-state applicants, or racing around the globe to attract international students to relieve the financial pressures they face from reduced state appropriations. For example, since the onset of the Great Recession in 2008:

- The 23-campus California State University system cut enrollment by 16,000 and increased tuition by about $2,000.[4]

- The University of Delaware pushed its enrollment of Chinese students from eight in 2007 to more than 500 by 2011.[5]

- The University of Oregon reached into California so often for students to pay higher out-of-state tuition that in 2010 it welcomed more freshmen from California than six of the California State University's campuses did.[6]

These changes come just as the United States needs more college graduates with high-quality degrees, as well as methods to make these credentials available at a lower cost. Right now, nearly half of American students who start college will not graduate with a bachelor's degree. The United States places twelfth among developed nations in higher-

education attainment by its young people.[7] What's more, 82 percent of students from families in the top income bracket in the United States now hold a bachelor's degree by the age of 24, compared to just 8 percent for those in the bottom income bracket.[8] If economic inequality continues to worsen, these trends will only intensify, putting the next generation at risk of being the first in history to be less educated than their parents.

The need to give more students access to high-quality public universities is clear. Yet many public colleges and universities are failing to respond. Rather than expanding enrollment and focusing limited public dollars on the neediest students, public institutions have increasingly adopted strategies to restrict enrollment and encourage the spending of student-aid dollars on merit awards, all in an effort to move up in the annual *U.S. News & World Report* rankings and earn prestige.[9] For many institutions, the ultimate prize is membership in the Association of American Universities, the exclusive club of 60 American research universities—even though those universities enroll only 6 percent of college students in the United States.[10]

The need to give more students access to high-quality public universities is clear. Yet many public colleges and universities are failing to respond.

With the economy stuck in neutral, tuition prices and student loan debt skyrocketing, and parents and students increasingly questioning the value of a college degree, our public institutions urgently need a different approach to the challenge of educating at a reasonable cost an increasingly diverse mix of students. But only a handful of leaders have tried to build a more inclusive and less expensive system. Rather than focus on the race for prestige that rewards exclusivity, these leaders are building the **Next Generation University**, one that is structured to better serve tomorrow's students.

This report focuses on a group of institutions that play a particularly important role in the face of these challenges—public research universities. These universities occupy a critical place in the higher education ecosystem.

Their faculties conduct nationally significant research even as the universities are deeply rooted in their communities. They are engines of economic growth and socioeconomic opportunity, producing regional business leaders, entrepreneurs, teachers, civic leaders and elected officials.

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They also play a unique role nationally, at a moment when our already stratified system of higher education threatens to reinforce rather than reduce socioeconomic disparity. Sadly, many of America's great research universities, both public and private, have made themselves largely irrelevant to this national challenge. The Next Generation Universities defined their role differently, focused on world-class research *and* providing a great education to large, diverse populations of students.

This report focuses on six public research institutions—Arizona State University, Georgia State University, the University at Buffalo, University of California at Riverside, the University of Central Florida, and the University of Texas at Arlington—that have expanded enrollment and achieved higher graduation rates in a cost-effective manner, even as their revenues per-student have declined. After the institutions were selected based on a detailed analysis of federal higher education data, each was studied through a series of site visits, interviews, and analysis of institutional policies.[8] The profiles that follow highlight the approaches these universities have taken. Each sits within a distinct state context, with differences in public funding, local demographics, governance arrangements and more. But while the strategies employed by these universities are not identical, there are many similarities between their approaches. In combination, they provide a template for building the Next Generation University.

The sections that follow provide detail on the strategies these universities are using and the results they are achieving. In describing these, we have chosen to privilege depth over breadth, providing a detailed profile based on one institution even though more than one of the universities studied exemplifies a particular strategy. The final section provides recommendations for institutions, states, and national actors like philanthropy and the federal government. These recommendations are based on four key conclusions:

- **An intentional student-focused vision matters**: the best of the institutions we looked at had a central unifying vision that drove the rest of their choices about productivity, technology, student success, and budget allocations. They are in it for the long haul. Senior leadership takes the time to develop and communicate a vision; and they assess investment priorities against that vision. Senior leadership then drives the vision deep into the institution. All the universities we studied had champions of a growth and access strategy in senior leadership positions. Faculty were also seen as critical players in the process of change at the institutions. Relationships between presidents and faculty are sometimes tense, and these universities are no exception. But the universities in this study distinguish themselves by having leaders committed to their public access missions and who understand the crucial role faculty members play in the governance of a university. Not all professors will follow these strategies, but their leaders have created incentives to reward those who do.

- **Bigger can be good**: Many of the key debates in higher education are about scale and efficiency.

The universities we studied were able to use growth as a solution to declining revenues, rather than contraction. To keep the focus on academic quality, they created small communities within the larger and growing whole. They leveraged their size to provide a base for expanding research excellence and adopted online technologies to reach more students at manageable cost without sacrificing student learning.

- **It is possible to enroll and educate large numbers of unevenly prepared students well, without diminishing quality**: The universities we studied are accomplishing this using technology to diagnose and personalize student learning experiences and help students make successful choices in choosing classes and majors. Strong partnerships with local community colleges help underprepared students catch up and transfer into baccalaureate programs, while need-based financial aid supports low- and middle-income students.

- **It is possible for institutions of higher education to innovate fast and at scale**: Many higher education institutions are loathe to change quickly, even when the times demand action. Public universities can use their advantage of size to collect large amounts of data, conduct small experiments, and scale up those that work. Data analytics can be used to determine where processes or systems are breaking down. These institutions are also in a strong position to influence state policy. The institutions we studied were able to win key support from state lawmakers, helping not just their students but those at public institutions statewide. ◆

Profiles of Next Generation Universities

Scaling the State University for Efficiency

The iconic image of American higher education is often of seminar-style classrooms in ivy-covered, Neo-Gothic buildings situated around a small campus quad in a quaint college town. This model is time-honored and often wonderfully effective. But it is also expensive and very difficult to grow quickly or to scale.

The expanding U.S. population and the need for a greater proportion of Americans with college degrees require universities to grow to meet demand. What's more, large enrollments provide opportunities to experiment with new pedagogical methods and online technologies in an effort to deal with reduced revenue and rising costs. "The advantage of size," says Mark Becker, president of Georgia State University, "is that it enables you to collect lots of data, conduct small experiments, and scale up those that work."[11]

Few campuses have embraced growth to drive change quite like Arizona State University, the largest public higher-education institution in the United States, with more than 70,000 students. At six campus locations spread around metropolitan Phoenix—home to nearly 1.5 million people—enrollment growth is a critical part of the university's mission. As Arizona State has grown by 16,000 students during Michael Crow's 11-year tenure as president, the university has come to mirror demographic trends in both the state and the nation.

A third of Arizona State's undergraduates are members of minority groups, one in three are the first in their family to go to college, and 40 percent of them receive Pell Grants. ASU's retention rate has increased, as has its number of bachelor's degrees awarded in STEM (Science, Technology, Engineering and Mathematics) fields. "We define ourselves by who we include, not who we exclude," Crow says.[12] The president talks often about how the admissions standards at Arizona State today are the same as the University of California at Berkeley and the University of Michigan—except in 1950. In other words, public universities long considered great have not always been so exclusive. "Right

now, the status of institutions is determined by exclusion," he says. "The higher the level of exclusivity, the higher the level of scarcity, the higher the level of status. We want to re-conceptualize the vision of the university. We will not advance this institution on a vision of status being achieved through exclusion."

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On Arizona State's palm-tree-lined main campus in Tempe, the most visible signs of the university's rapid growth are several new buildings rising from the desert. Much of this new construction is focused on research enterprise, especially in the sciences, where the university promotes hands-on experiences. It is through high-impact learning practices, such as undergraduate research, that Arizona State tries to personalize an impersonal place. It has established the Barrett Honors College, which is effectively a small liberal arts college inside the larger ASU research university. To manage the cost of new enrollment and create a platform for personalized learning technologies, half of Arizona State's students who take face-to-face classes also take at least one online class each semester. Despite significant enrollment growth, no new classroom buildings are currently on the drawing board.

On the northern edge of the Tempe campus, a light rail station connects students to the university's downtown Phoenix campus 20 minutes away, which houses the schools of nursing, journalism, and public-affairs, a location partly subsidized by the city to help revitalize the

downtown core. The university's Polytechnic campus is situated on a mothballed Air Force base 45 minutes to the east in Mesa, and ASU West, which focuses on the liberal arts, is in northwest Phoenix. You won't hear Arizona State officials call these "branch campuses," however, or refer to themselves as a system. "We think of ourselves as one university in many places," Crow says. By creating campus locations that serve specific purposes, Arizona State has avoided the duplicative nature of a traditional university system with its administrative structures, and of course, added costs.

As it has grown, Arizona State has worked to manage costs and improve quality by, Crow says, "innovating on all processes." The university put in place a data-driven advising system that provides direction to students as they register for classes and helps the university better plan its course needs; adaptive learning technology that has personalized education for students struggling with remedial math; and shorter seven-and-a-half week semesters mixed in with the traditional 15-week semester to allow students more flexibility in their busy schedules.

In the past five years, the innovations have paid off in greater efficiencies on a number of fronts for Arizona State. The university's expenditures per student has dropped $1,000 in that time to $15,200, some $3,000 lower than the average cost per student for research universities across the United States, according to an analysis performed by HCM Strategists.[13] The same analysis found that the university yields 36.5 students per employee compared to 23.8 for each employee for research universities overall. Indeed, across

Comparisons of Next Generation Universities

| Institution	Core Expenditure/ Student (Weighted)		Students (Weighted) per Academic Employee		Research/Faculty		Students (Weighted)/Faculty		Credentials/ 100 FTE	
	2005-06	2010-11	2005-06	2010-11	2005-06	2010-11	2005-06	2010-11	2005-06	2010-11
AZ: Arizona State University	$16K	$15K	29.8	36.5	$80K	$128K	41.8	55.9	22.8	23.7
CA: University of California—Riverside	$31K	$24K	23.9	25.6	$142K	$132K	40.2	46.6	20.8	18.4
FL: University of Central Florida	$10K	$10K	38.1	42.8	$71K	$90K	63.7	84.2	23.3	24.3
GA: Georgia State University	$12K	$11K	32.6	37.2	$41K	$31K	49.2	58.1	18.7	16.8
NY: University at Buffalo	$25K	$20K	20.9	27.2	$196K	$201K	32.5	43.2	25.1	20.9
TX: University of Texas at Arlington	$12K	$12K	35.1	44.1	$45K	$60K	58.1	74.8	22.6	21.7
Group Median	$14K	$14K	31.2	36.8	$75K	$109K	45.5	57.0	22.7	21.3
All Research University Median	$19K	$18K	21.9	23.8	$99K	$115K	33.5	38.8	21.8	20.5

Institution	6-Year Grad %		Underserved Grad % (Graduation Rate for Ethnic Minority)		Net Price for Low-Income Students		% Low-Income (% Pell Grant)		% STEM	
	2006	2011	2006	2011	2008-09	2010-11	Fall '06	Fall '11	2005-06	2010-11
AZ: Arizona State University	56%	57%	46%	45%	$5,502	$6,673	18%	35%	16%	18%
CA: University of California—Riverside	64%	67%	62%	64%	$7,065	$8,195	37%	57%	31%	32%
FL: University of Central Florida	58%	63%	50%	60%	$7,138	$6,822	16%	30%	16%	17%
GA: Georgia State University	41%	47%	45%	50%	$8,964	$9,203	32%	51%	11%	12%
NY: University at Buffalo	61%	71%	49%	59%	$9,002	$10,096	20%	29%	22%	28%
TX: University of Texas at Arlington	42%	40%	37%	40%	$9,402	$8,136	34%	46%	25%	19%
Group Median	57%	60%	47%	54%	$8,051	$8,166	26%	41%	19%	19%
All Research University Median	57%	60%	49%	51%	$8,639	$8,642	20%	31%	22%	23%

Source: HCM Strategists. All data can be found at http://www.highereducationtrends.com/next-gen-u/nextgen-1a.swf.

the six universities featured in this report, there is evidence that greater size has resulted in greater efficiency (see Table 1, previous page). The median expenditure per student for the entire group is $14,000. The median student per faculty member is 57, compared with 38.8 for the research sector as a whole. And for critics who might say that the efficiencies have come at a cost to research, output on that measure has grown across the six universities to a median of $109,000 per faculty member, just slightly lower than the $115,000 for all research universities.

In the business world, the prevailing philosophy has long been that efficiencies and savings can be achieved by getting bigger and building economies of scale. That is why companies grow or merge with competitors. For decades, higher-education researchers have questioned whether economies of scale existed at large colleges and universities. If so, could increasing the size of institutions be a cure for Baumol's cost disease, which maintains that higher education, unlike other sectors of the economy, is unable to increase productivity simply by automating its functions?

One hurdle researchers have encountered when questioning whether bigger is better in higher education is that institutions that look similar on the surface often have differences that affect costs, such as the types of students they enroll, their location, and the relative emphasis between teaching and research among their faculty. Even after adjusting for those differences, the results from empirical studies dating back to 1964 have been split about whether economies of scale exist in higher education. In the late 1990s, Robert K. Toutkoushian, a higher-education researcher at the University of Georgia, found that scale does lower costs up to a certain enrollment level, which he calculated was around 23,000 undergraduates. Above that, he found, costs climb as the number of personnel on campus increases to serve larger enrollments. Still, Toutkoushian's optimal enrollment figure at the time of his research--and even now--is larger than the student body at most public universities, so he suggested that "reductions in expenditures per student could be achieved in the short run through expanding enrollments."[14]
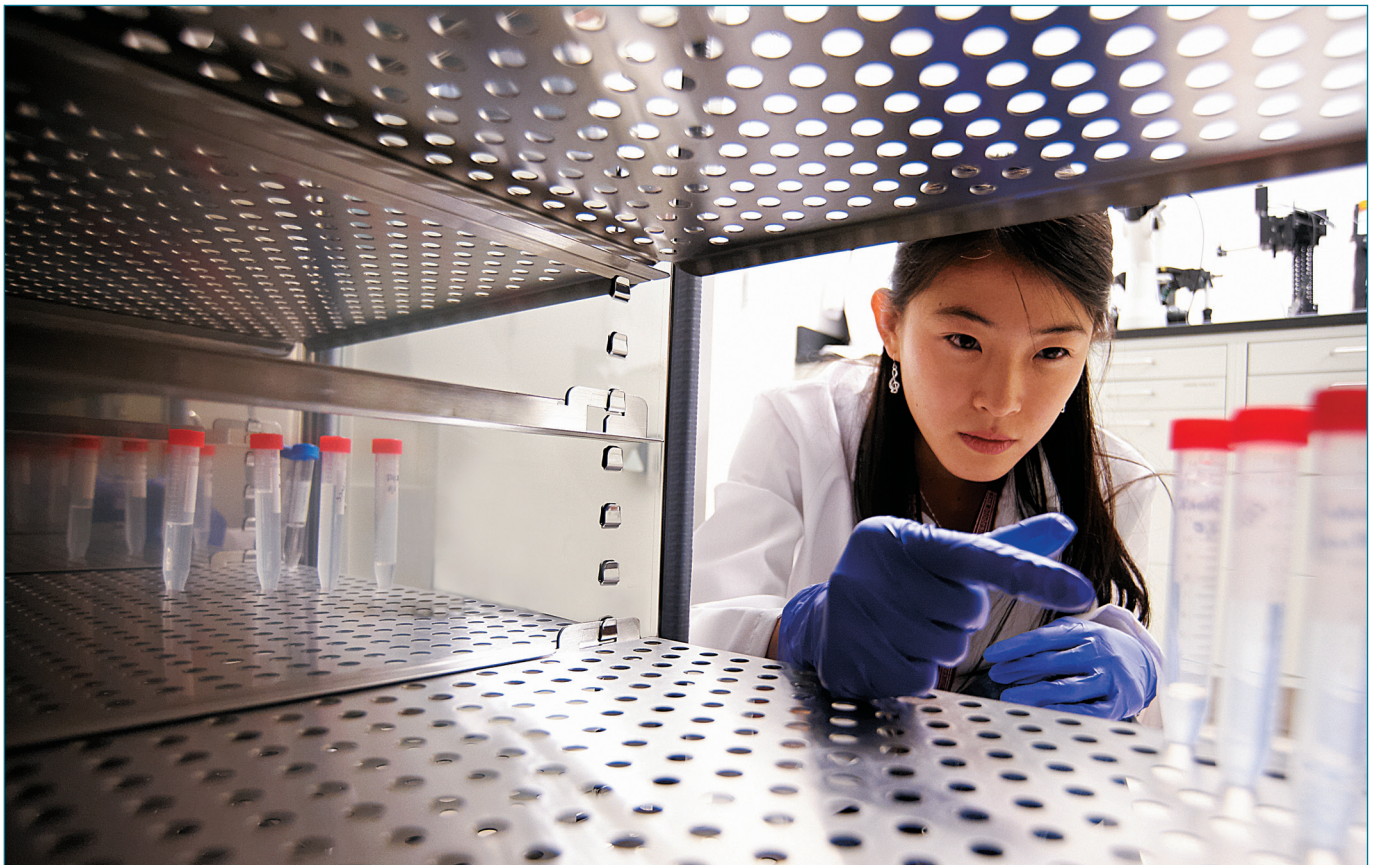
Much of Arizona State University's new construction is focused on research enterprise, especially in the sciences, where the university promotes hands-on research experiences. Photo Courtesy of Arizona State University.

Other studies on economies of scale in higher education are also at least a decade old, and as a result, fail to account for recent advancements in technology, particularly two key developments: online learning on a massive scale and data analytics. The first development, online learning, has evolved rapidly in just the last year. The widespread adoption of massive open online courses (MOOCs) and other open learning resources, such as the two dozen free courses developed by Carnegie Mellon University's Open Learning Initiative, have allowed more professors than ever before to incorporate electronic materials into their traditional classes and forgo face-to-face meetings by offering hybrid classes or fully online courses. These strategies can both reduce costs of campus-based instruction and potentially improve the quality of the student learning experience by providing individualized student feedback and orienting the learning process around mastery of defined competencies and skills.

The second development, the collection of data about student performance, has given a handful of universities the tools to track patterns that allow more personalized advising and course delivery. For more than two decades, the corporate world has mined massive amounts of data on their customers to better learn their habits and then shifted marketing, sales, and even products to respond to what they found. Now colleges and universities have also begun to harness the data they collect, in their case to help students in picking majors and making course selections. Data can even be used to direct a student to the next question in math class.

Public universities often insist that the only way for them to grow is with additional state subsidies to build classrooms, dorms, and hire an army of support staff to serve the new students. But the six public universities studied in this report show that growth is possible in the face of shrinking state resources without sacrificing their core mission of serving the state. As schools like Arizona State and Georgia State illustrate, building a cost-effective university can be achieved by rethinking ideas and processes and using new technology.

Going Online to Grow Enrollment

For the most part, the nation's public universities have been visibly slower than other sectors in higher education to expand into online learning, despite the ease of doing so thanks to recent advances in technology and pedagogy.

Arizona State, the University of Texas at Arlington and the University of Central Florida, are among those who have taken a deep dive into Web-based teaching.

The University of Texas at Arlington shares a trait with Arizona State and other public universities that are managing to prosper in difficult economic circumstances: it is in the right place at the right time. The Arlington region, home to 6.5 million people, is experiencing a rapid growth that is driven by immigration, oil and natural gas revenue, and a strong technology and defense sector that left the region relatively unscathed by the Great Recession.

The Arlington campus, which is affiliated with the University of Texas System in 1965, has been on a steady march ever since to remake itself, evolving from a sleepy commuter college into a public research institution. Texas has designated it as one of eight "emerging" research universities in the state. In 2010, the university opened a state-of-the-art engineering and science building that brought together researchers in computer science, engineering, bioengineering, and science. It is aiming to hire hundreds of new tenure-track professors in the coming years. And it has expanded its residential footprint, going from 1,500 students in campus housing in the late 1990s to more than 5,300 today. Overall, Arlington's enrollment has grown by nearly 40 percent to more than 34,000 since 2006. In that time, it has increased its outputs per faculty member by enrollment, degrees awarded, and research dollars, according to the analysis by HCM Strategists.[15]

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Much of the credit for Arlington's enrollment growth is the result of its online offerings. In the 1990s, to offset a sharp drop in enrollment, Arlington started putting courses online. By 2008, 5,100 students were enrolled in at least one of 630 online courses, 1,000 of them exclusively online. To further accelerate the growth of the online program, the university entered into an agreement in 2008 with Academic Partnerships, a for-profit company that
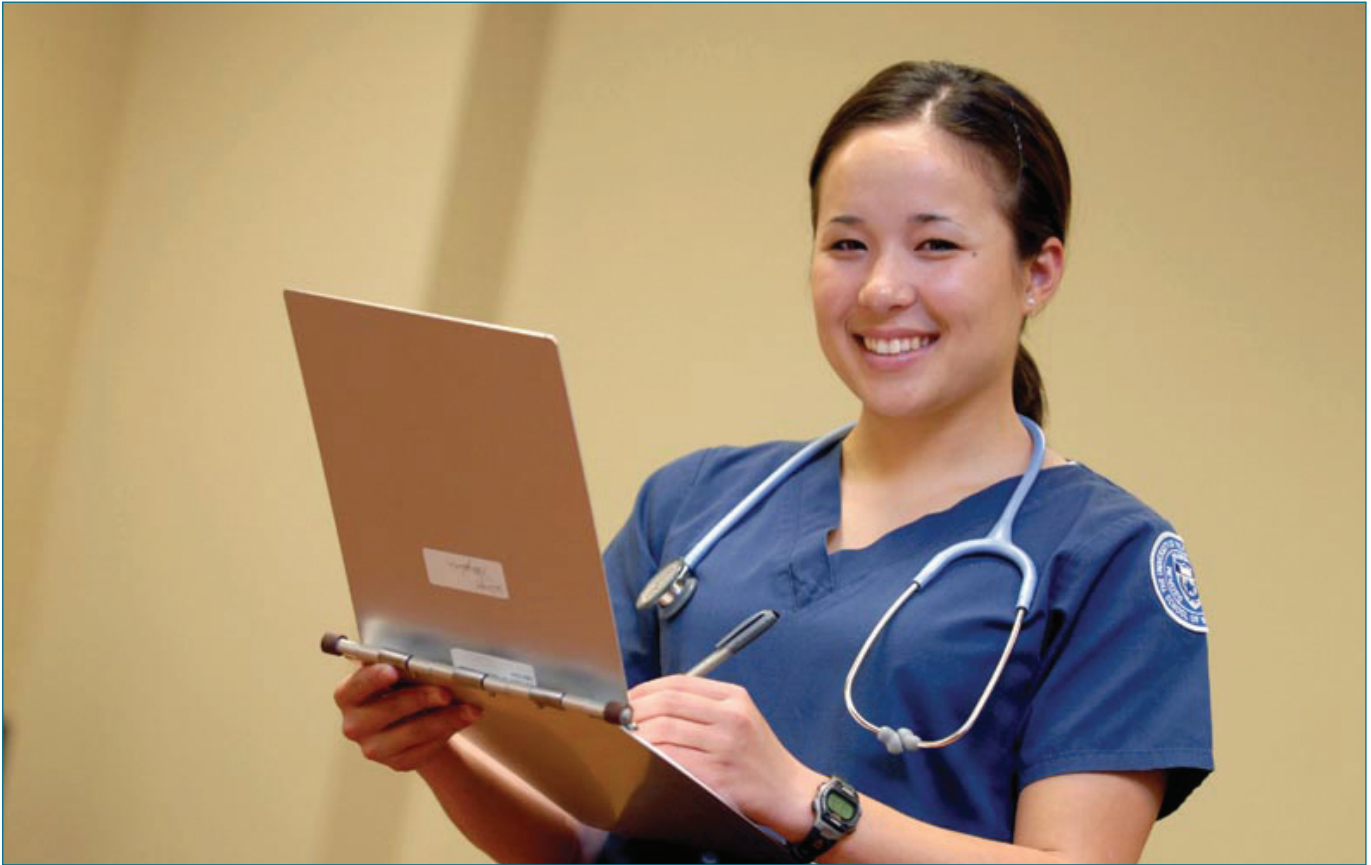
University of Texas at Arlington's online RN-to-BSN program is so popular it now operates as the nation's largest public university nursing school. Photo Courtesy of University of Texas at Arlington.

helps public universities build online courses and recruit students. By assisting the Arlington campus in establishing new online programs in high-volume professional areas, such as teaching and nursing, the university's enrollment grew substantially. Today, 42 percent of Arlington students take at least one class online, and 27 percent of them are enrolled exclusively online. About 60 percent of the online enrollment is managed by Academic Partnerships (with the remaining courses overseen by the university).[16]

Thanks to the online operations, Arlington now operates the nation's largest public university nursing school, with thousands of registered nurses who have two-year degrees streaming into the institution's bachelor's degree program. The nursing school enrolls more than 5,000 students online, compared to just 127 when it started the Web-based program in 2008. The agreement with Academic Partnerships—which receives 40 percent of the profits from new enrollments—has not been without its share of controversy on campus, in part because the expansion came without increasing the size of the nursing fac-

ulty. Professors supervise hundreds of students and are assisted by numerous "coaches" with advanced degrees to help answer students' questions. Many of the coaches are graduates of the program. Pete Smith, vice provost for digital teaching and learning, says it would have been nearly impossible to expand the online program without the help of Academic Partnerships, which can sign up hundreds of students at a clip by entering into corporate contracts. "Their magic is in marketing it to scale," Smith says. "We couldn't have grown this fast without them."[17]

While the Arlington campus turned to online learning to increase enrollment when its overall numbers were lagging, the University of Central Florida turned to Web-based technologies to accommodate growing demand for its classes in the Orlando region, where tourism and the technology industries have fueled sprawling growth. About 60 percent of the university's students take online or hybrid courses. Some 2,700 students enroll in an online, mixed-mode, or face-to-face course at the same time in any given semester. About 32 percent of the university's classes

take place online, which officials say eliminates the need for five classroom buildings. Even so, the university is constructing a new classroom building that will open in the fall of 2013. "We've become about as efficient as we can on use of classroom space," says Rick Schell, vice president and chief of staff.[18]

Scaling technology to serve greater numbers of students remains a critical component in helping public institutions grow.

April Krempasky is representative of the modern University of Central Florida student, a traditional residential undergraduate who toggles between three platforms in accessing her classes: face-to-face, online, and mixed mode (as hybrid courses are known at the university). Krempasky, an elementary education major from Ohio, just completed her junior year, and her course schedule was typical of her time so far on campus. Last fall, she enrolled in two online courses, one mixed-mode, and two face-to-face classes; in the spring, all her classes were face-to-face. Students at UCF give the highest marks in satisfaction surveys to mixed-mode courses. For her part, Krempasky doesn't have a preference—her choice depends on the subject and her work schedule. She favors the traditional face-to-face format for hands-on education courses and selects whatever format fits around her three jobs for the lecture courses that make up her hospitality minor. Despite working more than 30 hours a week and carrying a full course load each semester, she's on track to graduate in four-and-a-half-years with 140 credits. "Having different formats is a lifesaver," Krempasky says. "I wouldn't have been able to graduate this quickly if I didn't have options."[19]

The faculty at Central Florida seem more divided in their opinion of online and hybrid courses. "We want faculty to teach in the modality they are comfortable with," says one professor.[20] But the university has invested heavily to help prepare faculty members for a digital future. The university's Center for Distributed Learning serves as a clearinghouse for online learning strategies and practices and as a hub of training for professors. Nearly 1,000 faculty members have completed the professional development program for online instruction. "When I was at the

University of North Carolina, there were not a lot of people teaching online and not a lot of people wanted to teach online," says Tony G. Waldrop, Central Florida's provost and executive vice president. "So when I came here and saw all this online teaching, I wasn't sure it was of quality." But a centralized effort by the university "to provide support to faculty and then analyze the hell out of what we are doing" persuaded Waldrop otherwise.[21]

Now the university is spreading its work to other institutions. The university is developing a "Blended Learning Toolkit" that will include strategies for course design and delivery, models for composition and algebra courses, procedures for assessment and data collection, and training materials. The toolkit will be provided to American Association of State Colleges and Universities, which will then work closely with 20 of its member institutions to implement UCF's work. If successful, the toolkit could be expanded across all of the association's 400 institutions.

Changing faculty perceptions about online education is paramount in order to achieve wider adoption of technology in the classroom and increase efficiency.

Scaling technology to serve greater numbers of students remains a critical component in helping public institutions grow. At too many public universities, online learning remains a novelty. The examples of the University of Texas at Arlington and the University of Central Florida demonstrate how virtual learning can play into a larger strategy to improve efficiency and expand enrollment without rewriting the mission of the university or discounting face-to-face courses. Yet many professors remain skeptical of the role technology can play in the classroom. They view today's online offerings as second-rate, despite new formats popularized by the Khan Academy and MOOCs that feature short video clips and interactive quizzes rather than videotaped lectures.

Changing faculty perceptions about online education is paramount in order to achieve wider adoption of technology in the classroom and increase efficiency. Training faculty and analyzing student outcomes, as the University

of Central Florida has done, is a start. Further research into the impact of online learning is also needed. In 2012, Ithaka S+R, a nonprofit think tank, found that, after observing students in hybrid and face-to-face courses at six public universities, students learned just as much in a course taught partly online as they did in a traditional classroom.[22] It noted that substantial cost savings could come from hybrid courses, such as those taught at the University of Central Florida. In releasing the report, William Bowen, a former president of Princeton University and one of the authors of the study said, "the most important single result" of the research was that "it calls into question the position of the skeptic who says, 'I don't want to try this because it will hurt my students.'"[23]

Higher Education, Directed by the Numbers

No two students learn in exactly the same way, yet on many campuses the standard classroom experience features a professor at the front lecturing to dozens, sometimes hundreds of students. This was the case at Arizona State, which for years employed the traditional lecture format even for its most vulnerable students: those who needed remedial education in math. About 10 percent of Arizona State's freshmen arrive on campus unprepared for college-level math, so they need to take an extra course to review concepts from high school and pass a test before enrolling in a credit-bearing math class. The problem Arizona State faced was that many students in the remedial classes either never earned a passing grade, or if they did, they went on to fail their first college math class.

In 2011, Arizona State officials tested a new adaptive learning technology in an effort to personalize the learning experience and improve student success. The system, created by the start-up company Knewton, builds profiles of each student as they progress through lessons on a computer screen and delivers the next question based on their previous answers or recommends video tutorials when they get stuck on a problem. Students still attend classes scheduled at a fixed time, but instead of being lectured they work alone at a computer and at their own pace, as an instructor roams the room with a class roster that shows which students are on-track (in green) or off-track (in red).

The University of Central Florida has ten regional campuses across central Florida to give students flexibility in finishing their bachelor's or graduate degrees. Here, students sit in class at UCF Ocala. Photo Courtesy of University of Central Florida.

Georgia State, with one of the most diverse student bodies in the country, enrolls over 32,000 students in downtown Atlanta. Photo Courtesy of Georgia State University Relations.

Amanda Smith, a freshman psychology major at Arizona State, is one of the students who is off track. She is struggling with multiplying polynomials, and she has been spending about an hour and half each day out of class working through the online tutorials. "I like the fact that I can do my own thing, at my own speed," she says.[24] If this were a traditional lecture course, the professor would have moved on to the next topic while Smith still needed help on last week's lesson. Now she can spend as much time as she needs until she masters a concept. As she does, Smith collects points and earns badges. After six badges she will be ready to take the final exam, even if the semester is weeks away from ending. Although Smith is still working through multiplying polynomials in the middle of the fall semester, half of her class has already completed the final exam. For some students, finishing early means they could take an extra course offered in the university's seven-and-a-half week mini-semester.

Arizona State is redesigning six general education courses that significantly slow the academic progress of students who fail to complete them. Working with for-profit part-

ner organizations, Pearson and Knewton, and a team of ASU faculty, the university is transforming these courses from their current large lecture format to an adaptive and active learning classroom approach. The guiding principles for the course redesign are: 1) Mastery of each concept by every student, with mastery defined as proficiency at a predetermined level for all major concepts in a course; 2) Active learning using problem solving activities; and 3) Personalized, adaptive learning pathways. Students will start each subject with a diagnostic assessment that determines what instructional supports they receive, and they will take another assessment to ensure they have achieved mastery. If not, they are looped back for additional, adapted materials focused on the concept they are trying to master. Instructors focus assistance on the students until they have mastered the concept, and mastery is tracked on a dashboard available both to the student and to the instructor, indicating where students need additional assistance. ASU will pilot each of these redesigned courses in one class section, and collect rigorous evaluation data comparing student results to those of students in class sections taught the more traditional way. After evaluation and improvement,

the courses will be rolled out at scale. Provost Elizabeth Phillips says, "These adaptive courses will significantly improve our ability to track individual student performance on learning objectives and their progress towards mastery at a very detailed level. In our current large lecture courses, instructors have very limited ways of knowing where or why students are struggling until after a major exam when it might be too late to help them master the concept. The courses will also add an active learning environment that is inquiry based to build critical thinking skills."[25]

Using massive amounts of data to predict customer behavior has enabled companies, such as Amazon and Netflix, to use sophisticated tools to recommend books and movies. Increasingly, universities are employing a similar strategy to move students through to graduation on time.

Using massive amounts of data to predict customer behavior has enabled companies, such as Amazon and Netflix, to use sophisticated tools to recommend books and movies. Increasingly, universities are employing a similar strategy to move students through to graduation on time. At Arizona State, pass rates in the remedial math course rose from 66 percent to 75 percent in the first year Knewton was used, and the university's retention rate increased from 77 percent to 84 percent. Another reason for the increase: the eAdvisor system. eAdvisor tracks students during the crucial first four semesters of college when they are most likely to drop out, making recommendations on majors and courses, and at the same time, ensuring that the university offers the right courses and enough seats in any given semester. "Class registration lines shouldn't be like bread lines," says Phillips, Arizona State's provost. "If students need a psychology class, let's give it to them. Universities are not organized around what a student needs, when they need it."[26]

Georgia State University has designed a similar Web-based advising system, which pulls data from some 2 million student grades stored over the past seven years to help predict student success in courses. Algorithms figure in other parts of university life, as well, particularly student aid. Unmet financial need—the gap between a student's

tuition bill and what financial aid actually covers—is a growing problem at Georgia State. The average unmet need for undergraduates in the fall of 2011 was $5,434, up 31 percent from the previous year, mostly because of cuts to various state student-aid programs, which have cost students some $19 million. The biggest jump in unmet need was among first-year students. As students scramble to pay bills, their academic performance often suffers. The university has found a close correlation between the amount of unmet need for students and their grades. Nearly 60 percent of the students at Georgia State with less than $3,000 in unmet need have grade-point averages above 3.0; that number falls to 40 percent when unmet need rises to $12,000.

To help fill the gaps in financial need in targeted ways without draining the university's budget, Georgia State officials designed a series of pilot projects to test ideas on small groups of students. These "structured interventions," as they call them, were aimed at students who had the potential to do the most with extra dollars in financial aid. Georgia State regularly revised the experiments until they worked, and when they did, they expanded them and promoted the successful programs to donors. Among the efforts that have proven successful at Georgia State:

- **Keep HOPE Alive**. Georgia's HOPE scholarship, a broad-based merit award financed by the state lottery, plays an outsized role in the financial aid conversation at Georgia State. Students who lose the HOPE scholarship during college graduate at only half the rate of those who never receive the award in the first place. The university gives $500 grants to selected students who lose HOPE. Students who participated in the program had a 62 percent retention rate compared to 9 percent for those who didn't participate.

- **Supplemental Instruction**. The university looked at the biggest courses with the most D's, F's, and withdrawals in various departments. Then it found the students who performed well in those classes and were on financial aid and awarded them work-study dollars to serve as peer tutors in the semester after they completed the course. The average grade-point average in those courses with tutors rose a half a point. Retention went up by nearly 10 percentage points in one year. This is an

example of how a university leveraged financial-aid dollars for some students to increase the retention of other students.

- **Panther Retention Grants**. Students at Georgia State register for classes each semester without always knowing how they are going to pay their entire tuition bill. As a result, the university faces millions of dollars in unpaid bills the day before students must be dropped from their courses for nonpayment. While most of those bills are paid at the last minute, some students can't cobble together the funds to meet their need. So as soon as the deadline for payments passes, university officials comb their records to see which students owe small amounts of money, are close to graduation, and have good grades. They immediately contact them and offer small grants so they are not forced to drop out. In the fall of 2012, the university awarded $600,000 to more than 700 students, making the average grant less than $1,000.

For the grant programs, students are required to sign a contract with the university before they get the money. It requires them to complete an assessment of their learning preferences, as well as online courses on life skills and managing their finances. "We are not just giving out money, we're also trying to change behavior and improve student performance at the same time," says Timothy Renick, the university's vice provost and chief enrollment officer.[27] In just the last three years, overall spending on institutional grants and scholarships at Georgia State has risen by about $5 million.

The retention grants, which were started with dollars donated by the university's president, are now paid for through a special student fee. But university officials say that the relatively small amounts that they have funded in the pilot programs make a big difference in keeping someone in school, and that resonates with potential donors. "I have lunch with people I don't know to get $1,000," says Paul A. Alberto, interim dean of Georgia State's College of Education. "I tell them, 'If you won't name the College of Education, would you at least give me $1,000?' "[28]

Kelly Erwin, a senior interdisplinary studies major at Georgia State, is one of the students helped by the university's financial aid experiments. By the fall of 2012, Erwin

had exhausted her HOPE scholarship. The 26-year-old single mother had already registered for courses for the fall semester, but still needed a little more than $2,500 to cover her tuition bill. With classes about to begin, she was scrambling to come up with a plan to cover the shortfall. She was thinking about asking her dad for help or taking a semester off to work and save up extra cash. "I only had six more classes to take, so I really just wanted to get it over with," she says.[29] That's when the financial-aid office called with the offer of a Panther Retention Grant for $2,500. Her final tuition bill was $50, and she ended up not missing any classes. "You have to move quickly to reach out to the students," says Renick, "because if they don't hear anything, they stop attending classes and fall behind, quickly negating the goal of the retention grant."[30]

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The use of data to guide students through to graduation and ensure they have the financial aid to continue that journey is starting to show results at Georgia State. In 2011-12, the university awarded more than 7,300 degrees, the largest number in its history, and a 26 percent increase from four years earlier.[31] Over all, enrollment at the institution is roughly one third white, a third African American, and a third other groups including Asian Americans and Latinos. The graduation of all groups has risen in the last decade, in some cases dramatically: from 22 percent to 66 percent for Latino students and 29 percent and 57 percent for African American students, for example.[32] Given the advances in data science in just the past few years, it's a safe bet that with more information on students and improved analysis of the analytics, schools such as Georgia State and Arizona State will continue to search for new ways to use data to improve student outcomes. "We track almost everything about a student's life here to help us make this large campus a more intimate place for students," says Phillips, Arizona State's provost. "But in ten years, what we're doing today with data will probably look antiquated."[33]

University of California at Riverside has a diverse student population and is focused on the mission of making sure they graduate and succeed in the world. Photo by Carrie Rosema.

A Mission of Access

Since the beginning of the Great Recession, no place has been under more strain to maintain access to public higher education than California. Long viewed as a leader in American education because of its 1960 Master Plan that organized its state colleges into tiers and spelled out who should be guaranteed access, California's public institutions by 2010 enrolled more than 2.3 million students, or one out of nine college students in the United States.[34]

But years of state budget cuts have taken their toll on the public higher-education system. The 10 campuses of the University of California have seen their state funds cut by $1 billion since 2008, a reduction of 25 percent. In the face of these cuts, the state colleges and universities cut courses, programs, student services, and most damaging, they limited enrollment and increased tuition and fees — which then tripled at the University of California to some $12,000 — policies that in effect cut off access to much of the state's growing and diverse population. The University of California System became even more selective as it reduced campus enrollment targets, leading to a 7 percent decline in enrollment across its campuses. An

analysis by Public Policy Institute of California found that the University of California's share of the state's most-qualified high-school graduates dropped from 27 percent in 2006 to 22 percent by 2010.[35] Most of the students who were denied a place at the University of California ended up at the state's more expensive private colleges.[36]

These issues make the recent history of the University of California's Riverside campus even more remarkable. Since 2006, its enrollment has expanded by 25 percent, to more than 23,000 students. As the number of minority students at other University of California campuses decreased as a result of enrollment caps, the Riverside campus continued to attract underrepresented students from the surrounding communities. It is now the system's most diverse campus. Half the students are the first in their families to go to college. What's more, some 57 percent of the university's students receive Pell Grants, the highest proportion among the six Next Generation Universities, and its graduation rate for minority students — 64 percent — is also the highest in our group of six institutions. The university's land-grant mission is part of "what fuels this passion," says the university's interim chancellor, Jane Close Conoley. "The

Students perform experiments in the Pharmacology laboratory at University at Buffalo. The "Finish in 4" program guarantees graduation for students who agree to keep their grades up and meet regularly with advisers. Photo Courtesy of University at Buffalo.

people of the state gave us this land to educate them. We are committed to serving our population in the community and providing support to students."[37]

That service includes providing an extensive network of living-learning communities, which connects learning in and out of class and makes the large campus feel smaller by having students with the same major share both class schedules and residence halls. Such learning communities have been shown to increase student engagement, and ultimately retention and graduation rates. The campus employs another strategy known to engage students: undergraduate research. At Riverside, involving undergraduates in the workings of a research university has helped boost interest in the sciences, in particular. One-third of students on the campus are enrolled in STEM majors, the highest percentage among our group of six universities.

Both methods of engaging students have been expensive to maintain, especially in light of the state budgets. "Every

choice we made had trade-offs," Conoley says.[38] Class size has grown, and the university hired more adjuncts to fill in gaps. The number of student advisors has failed to keep pace with enrollment growth, so within some colleges at the university there are up to 600 students for every advisor. At the same time, however, the university was able to start a new medical school with $100 million in funds, none of which were provided by the state. The first students at the medical school start in August, where 24 seats in each class will be reserved for graduates of the university. For a long time, says Douglas Mitchell, interim dean and professor in the School of Education, Riverside "looked at the other UC campuses and said 'Why don't we get the elite students they get?' And then we decided to take the students we get, and make them elite."[39]

A cornerstone of the efforts at Arizona State and Central Florida to ensure access, increase enrollment, and maintain quality is an unusually high degree of coordination with local community colleges. At Central Florida, a pro-

gram called Direct Connect guarantees admission to the university for graduates of four consortium community colleges. On two community-college campuses, Valencia and Seminole, UCF shares facilities, so students never have to step foot on UCF's main campus in order to complete their bachelor's degree.

Direct Connect was organized by a regional group of colleges that focused on making transfer easy, and, equally important, informing students about that pathway through a branding campaign. The results have been impressive. At Valencia College, four in five graduates transfer to UCF. Indeed, nearly a quarter of UCF's junior class comes from Valencia. Recently, UCF expanded the concept of Direct Connect to include graduate education in its architecture program, in response to local business leaders who worried that the city didn't have enough architects to keep up with demand. The new 2+2+2 program allows students to earn an associate's degree at Valencia, transfer to UCF, and then earn a master's degree at the University of Florida by taking courses in downtown Orlando. The six-year program has a price tag of less than $40,000.

The transfer programs at Arizona State and Central Florida recognize a future where students will move among colleges and a network of other higher-education providers in pursuit of a degree.

At Arizona State, 40 percent of new students each year transfer from other colleges, more than most other public universities. "We have created a culture of transfer" as part of the university's mission, says Crow, ASU's president.[40] In its home county, the university developed "The Maricopa to ASU Pathways Program" with Maricopa Community Colleges, which details the requirements students must take at the two-year college and guarantees students admission into their desired major so they come in as true juniors who are on track to graduate in two more years of full-time study. Elsewhere in the state, ASU put in place transfer guarantees with Arizona's public community colleges and mapped more than two dozen of its most popular transfer majors to courses at each of the two-year schools. To oversee the programs, ASU hired a former community-college president

who receives data from the two-year colleges every week so that the university can be prepared for the students coming down the pipeline. The community college students are also part of ASU's tuition commitment that promises a predictable tuition schedule for a cohort of students. So even though the students from the community colleges don't arrive on Arizona State's campus until their junior year, they are charged the same tuition rate as the students who were already there for two years.

The transfer programs at Arizona State and Central Florida recognize a future where students will move among colleges and a network of other higher-education providers in pursuit of a degree. Right now, one-third of college students transfer institutions at least once before earning a degree, but most colleges still expect students to take a linear path to graduation. By limiting transfer credits, many schools make it difficult to earn a degree with credits from different sources. Frustrated by this system, students can end up dropping out of college short of a credential or collecting more credits than they need for a degree, paying more in the process.

Forging Partnerships

The policies and procedures the Next Generation Universities have put in place to increase efficiency came as a matter of necessity after years of state budget cuts. Rather than hope for the unlikely return of a time when state coffers provided a majority of their budgets, these institutions decided to develop new revenue sources and strategies to reduce costs. The University at Buffalo, for instance, worked closely to forge a partnership with New York's governor and legislature, securing new dollars from increased tuition and receiving a challenge grant to improve the economy of Western New York.

With more than $100 million committed from the state over the next five years, the University at Buffalo has already added more than 300 undergraduate course sections—creating 12,000 more seats—in high-demand classes in order to help more students complete college in a timely manner. The university also established a "Finish in 4" program, which guarantees graduation in four years for those students who agree to keep up their grades and meet regularly with advisers. In exchange, the university agrees to make available the courses they need to graduate on time or the required courses will be free. The new state money also will enable the university to

hire more than 250 faculty members, above the hundreds it will need to replace through normal attrition, and move forward with plans to build a new $375-million medical school, part of a new health-care campus in the city.

Rather than hope for the unlikely return of a time when state coffers provided a majority of their budgets, these institutions decided to develop new revenue sources and strategies to reduce costs.

Other Next Generation Universities are investing heavily in research and establishing partnerships with business and government as well. Arizona State is focused on "use-inspired" research—that is, research closely aligned with employers, workforce development, and job creation through spin-off companies. ASU realigned its academic programs to ensure they were on the cutting edge of the university's research agenda. In the past 10 years, the university cut nearly 70 academic programs and started two dozen new ones, mostly interdisciplinary departments focused on emerging ideas: human evolution and social change; earth and space; and technology and innovation. Meanwhile, Georgia State has tapped into economic development funds through the Georgia Research Alliance—even as higher-education dollars from the state dried up—to make "cluster hires" of faculty members from other research institutions, including the University of Rochester. "The question for us is how do you create a future where you can thrive as a research university and educate the full spectrum of America," says Becker, Georgia's States president. "We think you can do both."[41]

The University of Central Florida views partnerships as the fastest and easiest way to grow without state investments. "It's how we got to this point, so quickly," says Waldrop, the provost and executive vice president.[42] This summer, a new $665-million Veterans Administration Medical Center will open on the university's Medical City campus in Lake Nona, 20 miles south of Orlando, providing new opportunities for research and teaching.

And in downtown Orlando, a 68-acre plot of land—site of the city's former basketball arena—is being prepared to be home to a "creative village," a mixed-use office, residential, and retail development that will be transit oriented and be home to leading higher-education providers, including UCF, as well as hi-tech, digital media, and creative companies. Across the street, in a former conference center, is UCF's Florida Interactive Entertainment Academy and the Center for Emerging Media, which has combined the university's fine-arts programs, including an arts press, film, and architecture in one location. Soon, students in those disciplines will be in close proximity to the city's creative hub.

Already, the Center for Emerging Media is a magnet for video-game designers. Inside is a two-story room that looks like a network television studio and has the feel of sitting inside of a large black box. In the middle of the room are freestanding basketball hoops, putting greens, and other pieces of sports equipment. On any given day in this studio sports stars from Tiger Woods to Derek Jeter breeze through to record their movements for the next video game bearing their name. "Students are working in real-life situations right in the middle of the academic setting," says Paul Lartonoix, an assistant dean in the School of Arts and the Humanities. "They see the results of their education."[43]

The Path Forward: Future Policies

Because seven of every ten American students enrolled in postsecondary education attend a public college or university, the nation depends on these institutions to provide broad access at a critical time in our history.[44] A high-quality college degree is essential to success in a knowledge economy, and as the nation's college students become more diverse and financially needy, nearby public colleges might provide the only opportunity for a postsecondary education.

Yet by almost every measure, American states are retreating from their historic commitment to their public institutions, and in some cases, are essentially out of the business of public higher education. As state funding for students in public universities has decreased, tuition has necessarily increased to fill the gap. In 2012, across the country, net tuition revenue accounted for nearly half the educational costs of public colleges.[45] Just a decade ago, tuition covered little more than a third of costs.[46]

American public higher education is at a crossroads. We desperately need more universities willing to shift their strategies away from the race to prestige and toward ideas and policies that will help create more Next Generation Universities in the future.

In response to the retreat by the states, the majority of public colleges and universities, including many of the country's most iconic universities, are making matters worse by putting in place policies that restrict enrollment, increase tuition, and reduce need-based financial aid.

The universities featured in this paper are creating a different pathway to the future. The problem is that too few colleges and universities are following them. American public higher education is at a crossroads. We desperately need more universities willing to shift their strategies away

from the race to prestige and toward ideas and policies that will help create more Next Generation Universities in the future. Among these policies:

At the Institutional Level

Increase size to ensure broad access, test new ideas from pedagogy to student services, and serve growing populations. Despite cuts in state funds, public universities still have vast resources at their disposal, including well-established brand names. Universities often say they cannot get bigger without some infusion of cash or by lessening quality and excellence. But many of our institutions have increased class size without an adverse impact on retention and completion rates. A university can be high quality and big at the same time. Next Generation Universities demonstrate that size and research ambitions, enrolling high-achieving students, or attracting star faculty are not mutually exclusive strategies pursued in isolation from each other. The large universities featured in this report have discovered ways of making their campuses feel small, with living-learning communities, personalized adaptive learning technology, or separate campuses for clusters of disciplines.

Create direct connections between two- and four-year colleges to ease access for transfer students. The nation needs more than just growth in the number of students enrolled in postsecondary education; it needs more students graduating from college with degrees. Next Generation Universities successfully move students to graduation by forging strong partnerships with local community colleges. The most productive of the agreements go well beyond the usual transfer articulation pacts common in many states and closely link the two institutions, such as the University of Central Florida and Valencia College, which share facilities allowing students to finish a bachelor's degree on the campus of the two-year college.

At the State Level

Guarantee a low net-price for low-income students. Low-income students are more likely to enroll full-time and complete college when net prices are a reasonable share of fam-

ily income. Research shows that targeting financial aid to the neediest students has the largest impact on college attendance and completion. Thus, states and systems should focus on tuition moderation and encourage institutions to focus aid on the neediest and away from merit-based aid.

Adopt performance-based funding. To encourage research universities to grow enrollment and serve more underrepresented students, lawmakers should base appropriations on degrees awarded, rather than enrollment or graduation rates. Enrollment and graduation rates can sometimes encourage institutions to enroll students without a chance of success or focus only on admitting top-ranked students they know will complete a degree. Funding that focuses on outcomes and reaching under-served populations can provide incentives to recruit transfer students, reduce time-to-degree, and graduate more low-income students.

Create transfer policies that encourage completion. Strong state transfer policies encourage universities to admit large numbers of transfer students from community colleges and ensure that students are appropriately prepared for upper division work in their majors. Clearly articulated statewide general education requirements, common statewide course numbers, and major prerequisites can smooth the path for transfer students.

Public research universities must also commit to admitting students deemed college-ready and not just the best and brightest in an effort to increase their prestige.

Ensure students in the K-12 pipeline are prepared. States should commit their K-12 systems to better preparing students for success at research universities, making sure curriculum aligns with college-readiness. Meanwhile public research universities must also commit to admitting students deemed college-ready and not just the best and brightest in an effort to increase their prestige.

At the National Level

Develop Next Generation Leaders for Next Generation Universities. Higher education faces a potential leadership crisis in the decade ahead. The median age of the college president is 61, and with many expected to retire in the coming years, the pipeline to the presidency is running dry, especially at regional public colleges. As we can see from this report, innovative ideas for reforming higher education are being tested, and in many places, delivered with measurable results. But much of that work remains unfamiliar to would-be leaders interested in the vibrancy of higher education, and as a result, detached from their conversations and strategy about the future. We need to create the professional development opportunities for the next generation of leaders to build the next generation of universities.

We are not encouraging a new set of rankings, but outside organizations and the media should publicly recognize these universities for the bold steps they have taken and what they have achieved.

Acknowledge that external recognition remains important in higher education, and provide recognition for increasing access and student success. Universities often pursue policies that are not in the public interest because of the hope of receiving improved rankings, awards, or publicity, which in turn, help attract more students, better faculty, and bigger donations. The Next Generation Universities should be rewarded, too. We are not encouraging a new set of rankings, but outside organizations and the media should publicly recognize these universities for the bold steps they have taken and what they have achieved.

Create a demonstration program that challenges four-year public higher education institutions to innovate to:

1) Increase access and degree production;

2) Improve the quality of learning through greater personalization of instruction and student support;

3) Decrease cost;

4) Dramatically increase enrollment and graduation of students who reflect the socioeconomic and racial/ethnic profiles of their region.

This could include a competitive grant program for up to 15 public four-year universities to innovate to create Next Generation Universities. These universities would commit to expanding enrollment and graduation rates while holding tuition stable or lower. Eligible universities would have already demonstrated their capacity to serve students well, and their willingness to step up to enroll and graduate more. They would demonstrate:

- Commitment from high-level organizational leadership to expanding access, particularly for underserved populations, even in times of state budget cuts;

- Development of tuition and institutional aid policies that support the institutions' financial stability while increasing demand for accelerated, lower-cost models;

- A record of improving student support, persistence, retention and completion, for students overall and for sub-populations;

- Demonstrable restructuring and reallocation of expenditures to support enrollment and success of many more students.

The competitive grant program would make resources available to each of these institutions to support innovations such as:

- Use of technology to increase personalization, advise and support students, reduce time-to-degree and instructional costs and improve learning;

- Articulated pathways with community colleges to increase educational attainment and regional economic vitality;

- Continuous assessment of student learning and public reporting of outcomes, including collaboration in the development of a new set of metrics which more closely measure university cost/benefit effectiveness and student/faculty success;

- Commitment to academic excellence, particularly applied academic research that seeks solutions to regional or global challenges; expansion of interdisciplinary approaches and structures; support for entrepreneurship; and

- Proactive responsibility for building the economic, social and cultural vitality, health and well-being of their communities.

Desired outcomes would include:

- Improve freshman persistence to 90 percent;

- Enhance university graduation rate to 75-80 percent;

- Increase the number of transfer students from community colleges to the university, and their persistence to bachelor's degree completion, by 50 percent;

- Eliminate attainment gaps by income and race.

In combination, new actions and policies at the institutional, state, and federal levels can create powerful incentives for public universities to adopt Next Generation practices and substantially increase the number of students they serve. Retrenchment and contraction are not the only available responses to financial challenges. Public universities can move onto a more prosperous financial footing and provide more students with a high-quality education at the same time—if they take advantage of the strategies that the Next Generation Universities profiled in this report, along with others, have pioneered. ◆

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