TEXAS PUBLIC POLICY FOUNDATION

Winning the "Space Race"

How Universities Can Maximize Existing Space to Reduce Tuitions

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Center for Higher Education
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Executive Summary

Higher education is facing a crisis of affordability and, from it, a student-loan debt crisis. How might we effectively reduce the cost of college and the debt that often goes with it? One area of savings lies in maximizing the use of existing space already available on campuses before endeavoring to build anew. Fortunately for Texas, universities in other states, mindful of the cost of new construction, provide us models for how space-use maximization can address this issue.

In addition, capitalizing on the opportunities provided by online learning will also reduce the need for additional campus classroom construction. As the Texas Legislature begins to entertain requests by public universities for new construction funding, its members need to take the longer view on the likely need, or lack thereof, of new construction for higher-education classroom buildings. Specifically, they need to ask whether, in the years that transpire between legislative approval, contract bidding, excavation, and completion of the new classroom structure—roughly two to three years—there will be a sufficient number of students to occupy the envisioned halls. Simply stated, if Texas universities fail to adapt to the new paradigm of space maximization and online learning, hundreds of millions of dollars of taxpayer or tuition funds could be spent on what prove to be unneeded classroom and other construction.

A sober examination of the growth in enrollment in online college courses suggests that caution is called for before we confidently declare the next new-classroom building project shovel-ready. For the last 10 years, the Babson Survey Research Group, in collaboration with the College Board, has tracked online learning through surveys of over 2,500 academic leaders across the country. Its latest survey testifies that online learning has skyrocketed in the last decade.

Through incentivizing universities both to maximize their use of existing space and to offer additional courses online, the Legislature would go no small way toward keeping tuition down as well enabling students to graduate faster. Both effects translate into a more affordable college education for Texas students and therefore a smaller student-debt load with which they must deal after graduation.

Key Points

- Following the example of Kean University in New Jersey (as detailed in this study), the Texas Legislature should adopt measures to incentivize public universities to increase enrollment in Friday afternoon and Saturday classes. Doing so helped Kean add 700 students while simultaneously cutting an anticipated tuition increase from 20 percent to 5 percent.
- Following the example of Brigham Young University-Idaho (as detailed in this study), the Texas Legislature should require all non-Tier I, four year public universities to adopt a three-semester academic calendar. This move is anticipated by Brigham Young University-Idaho to increase student enrollments by as much as 50 percent. Brigham Young University-Idaho's administration projects that a school can save 20 percent of these fixed costs per student while also raising teacher's salary by 15 percent and giving faculty the month of August off.
- Texas should decouple the Early College High School program from traditional brick-and-mortar colleges and include a curriculum of internet-delivered courses provided by private nonprofit and for-profit institutions with national and regional accreditation.

Introduction

Texas' population is booming. Voting with their feet for the jobs created by Texas' relatively lower taxes and common-sense regulatory environment, citizens from the other 49 states and outside the United States have flocked to Texas at a high rate (487 a day) recently.

With this growth in its general population, it is small wonder that the college-age population is growing also. According to the Texas Higher Education Coordinating Board's "Enrollment Forecast," the Lone Star State's college-bound population has grown over the past decade, and is forecasted to grow further over the remainder of this decade.

On its face, more college students would seem to require more college spaces—more classrooms, laboratories, dorms, and the like—to accommodate them. But is this necessarily the case?

Two phenomena need to be taken better account of in order that Texas taxpayers' dollars are used with maximum efficiency when it comes to new building projects. First, it must be shown that existing space is being used fully, and second, the state's projected growth in the population of college-age students must be weighed against the documented growth in the number of college students taking at least some of their courses online. Clearly, students taking classes online lessens the need for new classrooms built of brick and mortar.

Only after these two factors are accounted for fully can the Legislature know with any reasonable degree of certainty whether tuition should be raised through Tuition Revenue Bonds ("TRBs") to fund new university building projects.

Lost in Space? How Some Campuses Are Attempting to Retrench After a Four-decade Growth in Construction

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". . . [T]he most serious mistake colleges made was to commit almost every dollar of their projected income to capital and operating expenses. Institutions that made overly optimistic building plans and other commitments are much likelier to be laying off employees or slashing budgets now."

~"Thirteen Reasons Colleges are in This Mess," *The Chronicle of Higher Education*

"Not only are the costs of our current space (operating, upkeep, and renewal) one of our largest areas of fixed costs, the costs associated with expanding our facilities are enormous. If we can make better use of existing space, we can save substantial funds that would otherwise need to be devoted to new buildings."

~University of Michigan Associate Provost, Paul Courant

Employing existing campus facilities more efficiently will make it less necessary to construct new buildings, lowering capital expenditures as well as ongoing maintenance costs. With such cuts in overall costs, universities would experience less pressure to raise revenues through increasing tuition. The need to restrain tuition increases is manifest: In Texas, and nationwide, college tuition and student-loan debt are escalating at unsustainable rates. According to the Texas Higher Education Coordinating Board, between 2003 and 2009, statewide average academic charges for a student taking 15 semester credit hours at a public university increased 72 percent in constant dollars. Nationwide, according to one study, average tuitions have risen 440 percent—faster than general inflation and faster than health care cost-increases over the same period.

To pay for tuition, students and their parents have taken on historic levels of debt. At 1.2 trillion dollars, total student loan debt is now—and for the first time in our history—greater than total national credit-card debt. Moreover, as reported by the Institute for Research on Higher Education, Texas "students and their families, already burdened by tuition hikes, have been forced to assume more responsibility for funding financial aid, too, through set-asides from tuition increases." The surge in tuition is pricing our top public universities out of the reach of middle class families. Lower-income students have access to scholarships, grants, and other need-based aid. Higher-income parents can afford tuition for their children. But families in between are being squeezed increasingly.

In sum, under the economic constraints known as the "New Normal" of the current American economy, individuals, families, and businesses have had to learn to do more with less. American public higher education must do the same. Exercising prudence with the use of their existing space is one important approach through which universities can work to keep down the cost of tuition and, therewith, of student loan debt. Should they fail to adjust their building plans to the new reality, they risk wasting hundreds of millions of dollars of taxpayer or tuition funds on superfluous classrooms and other construction. A parallel situation would be the railroad industry of the past, which significantly overbuilt both railroad tracks and rolling stock because it failed fully to appreciate the impact that large trucks would have on the transportation industry. The capital spent on those tracks and cars would have been much more profitably invested in roads and trucks. Similar shortsightedness on the part of public higher education runs the risk of harming both taxpayers as well as those students, and their parents, who pay college tuition.

A Space Odyssey: The Pennsylvania State University System's Journey to Space Maximization

Fortunately, there are universities that have already demonstrated success at maximizing the efficiency with which they allocate space. Scott Carlson's study of such efforts, "Campus Officials Seek Building Efficiencies, One Square Foot at a Time," analyzes Pennsylvania State University's efforts and effectiveness on this front. The Pennsylvania State University System boasts 19 campuses and roughly 23 million square feet of space devoted to classrooms, offices, laboratories, and meeting places. After a building boom in the first decade of the new millennium, the Penn State System has been forced to deal with the economic malaise facing the nation as well as declining numbers of student applicants at some of its branches. As a result, efficiency in allocating space has grown in importance.

The challenges faced by the Penn State System in this regard are far from unique: In addition to the sizable, initial cost of constructing a new building come the long-term expenses of building maintenance as well as utility bills. These additional financial burdens are more keenly felt in a time of ever-escalating tuition prices as well as student loan debt:

> Facilities are second only to personnel in campus expenditures. One gross square foot of construction can cost $300. Some experts say that on a five-million-square-foot campus, 1 percent of underutilized lab and office space equals about $3.7 million in wasted construction costs. And that's just the beginning. Maintenance, utilities, and renewal costs can compose about 70 percent of the lifetime costs of a building.[10]

But if students' straitened economic circumstances cry out for more scrupulous attention to maximizing the use of existing space, thereby easing upward pressure on tuition prices, "[p]art of the challenge of analyzing space utilization is that there are no reliable numbers to track." According to Phyllis Grummon, director of planning and education at the Society for College and University Planning, which studied campus space nationally from 2003 to 2007, "The people on campuses don't really want anyone to know."

What, then, do we know? According to Philip Parsons and Gregory Janks, planners at the Boston architecture firm, Sasaki Associates, Inc., the growth in college building has far exceeded the growth in the student population. In 1974, says Parsons, assignable campus space stood at roughly 160 square feet per student. Today, after four decades of massive building, that ratio has grown to approximately 450 square feet per student. "The space per student has in some cases tripled since the 1970s," Parsons estimates. Janks adds, "The mind-set that many institutions have had is that each institution needs to be complete unto itself, with one of every shiny toy that it can get, which means that there is often duplication of facilities on a regional basis. That leads to massive inefficiencies." "Every college wants a biotech research park," Parsons says. "It's unsustainable, and in many cases those research parks aren't doing well."

In 1974, assignable campus space stood at roughly 160 square feet per student. Today, after four decades of massive building, that ratio has grown to approximately 450 square feet per student.

Nor is this all. Over the same period, there has been comparable growth in student centers, recreation centers, and residence halls. "State-funding capital has diminished, so the things that you can fund are things that can be supported by student-fee-financed bonds," observes Parsons. In some cases, "fees are larger than tuition, which means that we are putting money into buildings that have nothing to do with the core educational mission—because we can." Add to this the fact that, over the past few decades, class schedules "have narrowed to the middle of the day," leaving classroom space unused during the early morning as well as evening hours.

At the same time, it should be noted that classroom space on a major state university campus like Penn State's composes only a fraction of the average campus's overall space—"less than five percent." Office space for faculty, administrators, and administrative staff, as well as student dormitories, "can each take up about 25 percent," while "research space is often around 12 percent."

The Pennsylvania State University System is not the only institution to recognize the need to become more fiscally prudent when it comes to new building projects. According to Phil Hanlon, vice provost for academic and budgetary affairs at the University of Michigan, the school's facilities grew dramatically from 1997 to 2007, but, with the recession, the school has seen the need to economize. "One thing we did right away," notes Hanlon, "is we put in a more disciplined and transparent process for the construction and renovation of space."

In what does the Penn State System's new process consist? Rather than allowing departments to tell administrators what they desired to see built, "they now have to deliver quite a bit of information about what their needs are and show how they are currently utilizing their space." One illustrative instance of the new policy is the response a department received from the administration after it requested additional classrooms. "They schedule six classrooms," says Hanlon, "and when we showed them the data, they were using those only about 20 percent of the time."

Keen on Cutting College Costs: The Success of Kean University

Another model for imitation in successfully prosecuting the space wars is Kean University. The school's administration found that merely 11 percent of its classrooms were being used on Friday afternoons. Utilization stood at but eight percent on Saturdays, according to the university's president, Dawood Farahi. Farahi's initial effort to expand the course schedule met with some resistance from the faculty, but, in time, some expansion of the class schedule was successfully implemented. This success is explained by the fact that, under the old class schedule, if Kean was to cover its operating budget in a time of state budget cuts, it would have been forced to hike tuition by nearly 20 percent.

Instead, under the new, expanded classroom schedule championed by President Farahi, classroom utilization on Fridays now stands at nearly 50 percent; on Saturdays, classroom utilization now totals 16 percent. The result? Kean "has been able to accommodate more than 700 additional students without any new construction and with a tuition increase of less than 5 percent." As an additional incentive, Kean now offers single-course discounts of up to

20 percent to students who enroll in Friday afternoon and Saturday classes. As an added entrepreneurial touch, the university, according to President Farahi, now searches for renters of the classroom space left empty on weekends.

Kean University's efforts speak forcefully to the situation in Texas public universities. President Farahi trumpets his space-economizing measures as instrumental in keeping college accessible for Kean's student population, one quarter of which "are either first-generation Americans or the first in their families to go to college." Says Farahi, "Opportunity becomes meaningless if it's unaffordable. It makes it kind of incumbent upon us to be creative and innovative to use the resources that we have." To be sure, Texas also is home to a large and growing number of students who "are either first-generation Americans or the first in their families to go to college." These Texas students and their parents are no less in need of the economizing measures advanced by Farahi than are students in New Jersey.

Space Revolution Rising at Brigham Young University-Idaho

Of late, BYU-Idaho, Brigham Young University's campus in Rexburg, Idaho, has garnered a great deal of attention among higher-education reformers. As reported by Sara Lenz, nine years ago, BYU-Idaho faced a challenge similar to that faced by Texas public universities—how to enroll more students without raising costs. The temporary solution found at the time was to "adopt a year-round calendar, with two block semesters in the summer," which "would increase the number of students without having to build any new buildings." But this solution also carried challenges of its own:

> Students with the highest grades could pick what time of the year they wanted to come to BYU-I, and they typically choose to come during the fall and spring semesters. Moreover, the course offerings were not equivalent, so access for summer was very different than the fall and winter semesters. And while the summer months brought thousands of more students to the campus, this was minimal compared to what it could offer.

To address this challenge, BYU-Idaho opted to move to a three-semester academic calendar, in which each semester was equal to the others. This would require that it offer "every class, assign students of different backgrounds and academic ability to certain semesters and provide equivalent offerings across all three semesters. To do this would require professors to work year round."

No surprise, the proposal met with faculty resistance. Faculty were "being asked to give up most of their summers —the most beautiful time of year in Rexburg, a place known for its long, cold winters."

But BYU-Idaho's president Clark persisted, for the three-semester proposal promised to (1) increase student enrollment by as much as 50 percent, and (2) increase "savings, since up until then buildings sat half-empty in the summer and counselors, administrators and salaried personnel were still working during these months with many less students. The school could save 20 percent of these fixed costs per student while also raising teacher's salary by 15 percent and giving them the month of August off."

Further discussion and collaboration with the faculty brought its acquiescence. Students also came largely to accept the new order of things. "Today, there are far fewer complaints about the summer and spring semester from students. Before the implementation in 2004, total spring enrollment was 8,287. In 2011, it had risen to 14,296."

From Space Utilization to Cyberspace: Factoring in the Growth of Online Learning

"By 2015, the number of students who are taking classes exclusively in physical brick-and-mortar spaces will shrink by two-thirds."

~Speech to the Economic Club of Indiana by Former U.S. Secretary of Education Margaret Spellings[30]

"Regarding costs, most analysis of the issue fails to account for the considerable capital costs associated with traditional instruction, costs that virtually disappear with on-line courses. They fail to take into account the savings that can occur from reduced commuting and room and board costs when students can take courses from their home, a particular advantage for those in lightly populated rural areas."

~From "25 Ways to Reduce the Cost of College"[31]

While the measures listed in the preceding pages endeavor to maximize the use of existing space, a new avenue is now open to universities by which to "increase space"—that is, through courses taught in cyberspace. The following sub-section is intended to acquaint the reader with the background behind the meteoric growth in online education, in order that we might better anticipate the contours of what may well be the future face of higher education—or, at least, the future face of a growing portion of higher education.

Background: The Rapid Rise of Online Education[32]

Since the invention of the telegraph, advances in information technology have been chipping away at the shackles of space and time, enabling virtually instant communication across land, oceans, even interplanetary space. This progress in information technology takes place within the world's movement from the Industrial to the Information Age, in which intellect, perhaps above all else, has today become the effective basis of corporate capital valuation. In the New Economy, intellect as well as capital glides globally at warp speed. This has reduced the relevance of a number of the technical skills and occupations valued during the Industrial Age. These skills have lost purchase in today's economy in much the same manner and for many of the same reasons that computer software loses its cutting edge almost as soon as it hits the store shelves.

According to a growing consensus of education analysts, these advances in information technology promise also to provide a revolutionary response to the new challenges posed by the Knowledge Economy. A key player in this burgeoning revolution is online education. From Clayton Christensen's and Henry Eyring's *The Innovative University* (2011),[33] to Richard DeMillo's *Abelard to Apple* (2011),[34] to Terry Moe's and John Chubb's *Liberated Learning* (2009),[35] we learn the extent to which the ground has shifted beneath the feet of the education establishment. DeMillo deems this transformation so far-reaching and rapid that more than a few universities will fail to "survive the coming changes."[36] Michael Horn, co-author with Clayton Christensen and Curtis Johnson of *Disrupting Class* (2008),[37] goes so far as to predict: "I wouldn't be surprised if in 10 to 15 years, half of the institutions of higher education will have either merged or gone out of business."[38] At the very least, adds DeMillo, none will be able to proceed on the basis of education as usual. Instead, the coming paradigm will create "a new set of rules and a very different conception of the value of universities in the twenty-first century."[39]

In one sense, online education may be said to democratize higher education. First, it facilitates a much more student-centered approach and, in so doing, enables a heretofore undreamt of degree of course customizing. Students come to school with different strengths and weaknesses. Advances in online-learning technology better enable each student to fulfill his or her potential through finding the pace and path that fits him or her best. Second, online

learning may be said to democratize postsecondary education through its capacity to increase access for those currently unable to avail themselves of brick-and-mortar education, such as working adults, parents of young children, those living in remote rural areas, and those who cannot afford the high and ever-escalating cost of traditional higher education.[40]

For the last decade, the Babson Survey Research Group, in collaboration with the College Board, has tracked online learning through surveys of over 2,500 academic leaders across the country. Its 2011 survey, "Going the Distance: Online Education in the United States," testifies that online learning has skyrocketed in the last decade. More important, this growth, impressive as it has been, is likely to be trumped by what follows.

"The rate of growth in online enrollments is ten times that of the rate in all higher education," writes the study's co-author and Professor of Statistics & Entrepreneurship at Babson College, I. Elaine Allen.[41] According to the survey's web site, thirty-one percent of higher education students currently are enrolled in one or more online courses. Over six million students enrolled in at least one online course during the fall 2010 term, an increase of 560,000 students over the previous year. The real weight of this number is illuminated by the fact that this 10 percent growth rate for online enrollments far exceeds the 2 percent growth in the overall higher education student population. Student satisfaction is comparable for online and traditional courses, according to the academic leaders surveyed. Moreover, two-thirds of the higher education institutions surveyed testified that online education today has become critical to their long-term education strategy.[42]

While internet-based activities—learning, commerce, social networking, etc.—are acquired tastes for those of us who are older, for today's undergraduate and graduate students, they are as "natural" as texting.

The reasons for the documented growth in online education are not difficult to discern.[43] For those 30 and younger, the internet has been a part of life since their earliest teens. While internet-based activities—learning, commerce, social networking, etc.—are acquired tastes for those of us who are older, for today's undergraduate and graduate students, they are as "natural" as texting. Add to this the fact that the flexibility offered by online education addresses a felt need of the largest segment of consumers of American higher education—non-traditional students, who form the majority of today's postsecondary students. More than half of students enrolled in higher education today are over age 25; approximately one-third are working full-time while pursuing their education.[44] Such students, by and large, can ill afford to relocate to attend a four-year college. Many have families of their own to raise and for which to provide. For those who must work full time and cannot relocate, by what means can they hope to earn a postsecondary certificate, or an Associate's or Bachelor's degree? For more than a few of this, the new majority, the best if not only option is online education.

"When technology is used, it boosts student achievement," writes John E. Chubb in the April 2012 study, *Education Reform for the Digital Era*, prepared for the Thomas B. Fordham Institute. While his focus is on K-12 education, Chubb's observations are equally applicable to higher education: "Online programs allow schools to customize instruction to individual student needs. They also offer students one-on-one tutoring by teachers working remotely. … In sum, technology can bring many instructional tools to the student that a regular classroom teacher simply cannot."

A Model for Imitation? The Online Revolution at Brigham Young University-Idaho

The educational innovations at Brigham Young University-Idaho, discussed in the pages above, have not been limited to space efficiency alone. After president Clark's administration had lowered costs through becoming a year round school, it turned to examine the question of through what methods it might achieve the highest of its strategic objectives—"reaching more students."[45]

Up to this point, Brigham Young University-Idaho had made little innovation in its online instruction regimen after instituting it 10 years earlier. Online instruction was treated as an "auxiliary to the university, with pockets of innovation scattered throughout campus. Few students on campus actually took classes online and those who did used them when a class they needed was full, or when work conflicted with schedules."[46]

All this changed at the school as the result of ongoing evaluations by the administration and faculty. In 2008, a new path was proposed that would alter fundamentally the school's strategic vision for online learning. The new vision questioned whether faculty on campus in fact needed to be the instructors of the online courses. Instead, "What if the faculty on campus didn't teach the online courses? What if qualified instructors, those with master's or doctorate degrees in relevant disciplines who were out in the workforce taught the classes remotely?" Moreover, instead of a few online courses scattered across the campus and the disciplines, now, "every class would be offered online, and every student would take an online course. This, more than anything else, would allow the university to expand its enrollment and reach."[47]

But if admissions and access would be increased through universalizing online education, what about education quality?[48] Might the school buy affordability and access at the price of diminished student learning outcomes? To address the concern over education quality, Brigham Young University-Idaho opted to pair on-campus faculty (who contributed content expertise) with those with expertise in constructing and administering online courses. Next, they "tested the classes with remote adjunct faculty who were asked to teach the course online."[49]

Overall student enrollment grew 60 percent between 2001 and 2011. Brigham Young University-Idaho has cut the Gordian Knot of lowering costs while simultaneously increasing enrollment.

The result of these efforts was a "Learning Model" approach that "required collaborative learning and cohort-based progress." Residential faculty members, aided by online course design experts, built online courses that would allow students to interact, both "with each other and with the instructor, through online study sessions, Skype, message boards and instant messaging." Although promising on its face, this approach, they worried, might not do justice to all classes and course material. One such difficulty that immediately surfaced as faculty worked to translate their courses into online offerings was that of teaching painting in the art department. They were surprised to find that, in the case of the introduction to drawing class, which was one of the most popular offerings on campus … there were actually some advantages to teaching the course online."[50]

Under the old regime, the introduction to drawing class was housed in a studio, of which there were understandably only a limited number on the Rexburg campus. The scarcity of available studios reduced the number of sections of the class that could be offered at any one time on campus. Nor was one art teacher attempting to teach a large class of beginning students the basics of drawing an "ideal" learning environment: "Students in the back of the class, or those positioned at an odd angle in relation to the easel, had to crane their necks to see what the instructor was drawing, and once a certain part of the drawing was complete, he or she moved on." The online approach obviated these difficulties: "[O]nline, the experience was different. Every student had a front row seat, and could pause and rewind the video until they completely understood the concepts. They could also provide peer review and feedback by sharing their insights with others. Today, nearly everyone at BYU-Idaho takes an online course in addition to traditional classes, and nearly every course is offered online.[51]

Perhaps no one was as pleasantly surprised by these findings as Brigham Young University-Idaho's biology department head, who commented, "I felt initially that it would be a big challenge to put classes online. I had always thought online was going to be inferior to face-to-face—it just seemed like a removed process from teacher to students. That couldn't be the further from the truth. With the learning model as a guide, students and teachers are well connected." He adds that online learning "has also opened up possibilities of different ways we can educate. I am now a fan of our online courses. It helps us reach out to more and more students."[52]

The increase in online enrollments since that time has been marked. "In 2009, the equivalent of 880 students took full semester loads online." By 2011, "that number had jumped to 2,140."[53] Overall student enrollment grew 60 percent between 2001 and 2011. Brigham Young University-Idaho has cut the Gordian Knot of lowering costs while simultaneously increasing enrollment. "By not paying for office space, classrooms, and benefits, it's safe to say that it costs us less than half as much to teach courses online as it does face-to-face," comments the school's associate academic vice president for Academic Development. "With relatively modest resources you can do a lot," adds President Clark. "The things that matter most typically don't cost very much. … In the end, you can be very innovative and very frugal."[54]

Conclusion

In light of the above, this study recommends the following: rather than wish for a return to a brand of education already rendered in some respects antediluvian, it is more practical to embrace the utility and develop further the functionality of online learning.[55] Given the breathtaking speed with which progress is being achieved in information technology, this embrace should begin, but not end, with the three measures recommended at the outset of this essay:

- Texas should decouple the Early College High School program from traditional brick-and-mortar colleges and include a curriculum of Internet-delivered courses provided by private non-profit and for-profit institutions with national and regional accreditation.
- The Governor should appoint a commission to review the Core Curriculum requirements at Texas public community colleges, colleges, and universities in order to learn whether access to those programs via the Internet would improve the civic education of Texas college students and citizens.
- Expand the online degree rider that was successfully added to HB 1 during the 2011 session (82nd Legislature). The rider requires public institutions of higher education to submit to the Coordinating Board a cost study of the four most popular degree plans that can be made available online. This cost study should be expanded to include all STEM (Science, Technology, Engineering, and Mathematics) courses, not covered by the first study, plus all lecture courses in all fields.[56] ★

Appendix A: History and Revenue of Tuition Revenue Bonds

Author's note: For four decades, Tuition Revenue Bonds have financed 98.4 percent of capital projects on public university campuses in Texas. The bonds, first authorized by statute in 1971, are used to acquire, purchase, construct, improve, renovate, and enlarge or equip property, buildings, structures, facilities, roads, or related infrastructure on college campuses. The debt from these bonds is serviced with revenues from student tuition charges, or taxes on institutions that are specified in the bond covenants.[57] In the past, the Legislature has approved reimbursement to the institutions for payments made to retire the tuition revenue bonds by means of special items as part of the general revenue appropriations.[58]

From THECB, "Overview": What is a Tuition Revenue Bond (TRB)?

According to the Texas Higher Education Coordinating Board's (THECB) website, Texas public universities and health related institutions issue tuition revenue bonds (TRBs) for capital projects after "following a thorough process."[59] Tuition Revenue Bond debt is serviced with "1) revenues from projects; 2) revenue provided by income from student tuition charges; or 3) levies upon institutions as specified in the bond covenants."

Under the Texas Education Code, Section 61.0572(e), THECB is given authority to review all real property financed by TRBs "to determine whether the property meets the standards adopted by the Board for cost, efficiency, and space use" and to inform the Governor, Lieutenant Governor, Speaker of the House of Representatives, and the Legislative Budget Board if the property fails to meet those standards. Ordinarily, Tuition Revenue Bonds are employed to supply funding to "acquire, purchase, construct, improve, renovate, enlarge, or equip property, buildings, structures, facilities, roads, or related infrastructure on or for a university or health related institution."[60]

The process by which the Texas Higher Education Coordinating Board evaluates Tuition Revenue Bonds consists in the following:

1. If requested by the Legislature, the Coordinating Board evaluates the requests for authority submitted by the institutions in their Legislative Appropriations Request.
2. The Legislature authorizes issuance of the bonds in legislation.
3. The institution requests project and financing approval from its Board of Regents.
4. The Board of Regents grants approval for the project.
5. The project is submitted to the Coordinating Board for evaluation. (Since the project was previously approved by the Legislature, the Coordinating Board's role is to evaluate the project to determine if it meets the Coordinating Board's standards found in Chapter 17, Resource Planning Subchapter J., Rules Applying to Tuition Revenue Bond Projects.)
6. The Coordinating Board approves the evaluation, and a copy is provided to the Governor, Lieutenant Governor, and the Legislative Budget Board.
7. The institution (or system) completes an application for the Bond Review Board.
8. The Bond Review Board verifies that the institution has approval for the issuance of the bonds, analyzes the project request to determine that the funds are available to service the debt, and that the financing system is appropriate.
9. The Bond Review Board authorizes the issuance of the bonds.
10. The Attorney General reviews and approves the issuance of the bonds.
11. The institution (or system) sells the bonds and services the debt.
12. Upon completion of the project, the institution includes the facility (if appropriate) in its facilities inventory.[61]

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Legislative History of Tuition Revenue Bonds (TRBs)

The Texas Higher Education Coordinating Board's website also lists the "Legislative History of TRBs":

- "The Texas Legislature first authorized $267.5 million in TRBs for particular campuses in 1971 and 1973. By 1974, $242.5 million in TRBs had been issued.
- In 1991, as part of the South Texas Border initiative, the 72nd-74th Texas Legislatures granted $421.4 million in new bonding authority.
- In 1997, the 75th Texas Legislature authorized new bonding authority to 41 institutions, totaling $638.4 million.
- In 2001, the 77th Texas Legislature authorized $1.08 billion to 49 institutions.
- In 2003, the 78th Texas Legislature, Regular Session, authorized $220.4 million to eight institutions, and the Third Called Session authorized $48.5 million for two institutions.
- In 2005, during the 79th Texas Legislature, Regular Session, higher education institutions initially requested $3.1 billion in tuition revenue bond authority for 119 projects, requiring an annual debt service of $286.7 million. The Legislature did not act on these requests during the Regular Session.
- In 2006, during the 79th Texas Legislature, Third Called Session, the Legislature asked the Coordinating Board to develop new criteria by which TRB projects could be evaluated for funding decisions. A total of 155 proposals valued at $4.5 billion were resubmitted for review and evaluation by the Coordinating Board using the new criteria. The Legislature finally approved 63 projects totaling $1.86 billion, but did not provide funding for the projects at that time.
- In 2007, the 80th Texas Legislature appropriated funding for the TRB projects approved during the previous legislative session and also authorized $13 million for one institution.
- In 2009, the 81st Texas Legislature authorized $155 million for two institutions."[62]

"The terms for financing TRB's consist in the following:

- Fixed rate interest payments, also known as coupon payments, are distributed over the term of the note.
- Tuition, rentals, rates, and other charges of an institution of higher education may be pledged to the bond payments.
- Historically, the state has paid the annual debt service of TRBs with general revenue appropriations."[63]

Appendix B: Brigham Young University-Idaho's "Three Track System"

(From http://www.byui.edu/admissions/three-track-system):

"BYU-Idaho operates year-round with three distinct 14-week semesters: Fall, Winter, and Spring. Each student is admitted to a track consisting of two semesters: Fall/Winter, Winter/Spring, or Spring/Fall. Students can enroll in classes only for the two semesters of their assigned track and remain on the same track for the duration of their time at BYU-Idaho.

"During the application process, applicants are asked to indicate the first semester they are available to attend the university. Students may be assigned to any of the three tracks. Some students will be assigned to begin in the second semester of a track (example: assigned Spring/Fall track starting in the Fall). Others may be admitted to start in a semester other than the first available semester indicated (example: available Fall, assigned Winter/Spring track starting in the Winter).

"The Three Track System allows BYU-Idaho to admit thousands of additional students each year. The campus serves about 15,000 students in a semester and over 20,000 students over the course of a calendar year. Each student has the opportunity to complete a baccalaureate degree in four years by attending two semesters per year.

"The Three Track System also helps BYU-Idaho make better use of sacred university resources. By utilizing campus facilities year-round, the relative cost per student is reduced. Faculty and staff serve student needs throughout the year, providing an equivalent experience on all tracks.

"Track Decision Process
As part of the admission process, BYU-Idaho students are assigned to a specific track that remains permanent through graduation. Track assignments are carefully considered, with the goal of enrolling a balanced and varied student body across all three semesters. The university is committed to providing numerous opportunities to students who come from a variety of backgrounds and share values based on the gospel of Jesus Christ. Through this commitment, the university fulfills its mission to provide an educational experience of continually increasing quality.

"To further enhance the effectiveness of the Three Track System, BYU-Idaho has introduced a two-stage procedure for admission and track assignments:

- **Step 1:** Prospective students submit a formal application that screens for admissibility. The Admissions Committee reviews each application. If the applicant is accepted, an offer is extended to attend BYU-Idaho.
- **Step 2:** Admitted students then complete a questionnaire that gathers additional personal information to help determine appropriate track assignments. At the same time, the university carefully considers when these students are needed most on campus in order to enroll a balanced and varied student body across all three semesters. Once all the information is individually reviewed, a track assignment is made."

Appendix C: "How Many Students Are Learning Online?"

(From Babson Survey Research Group's *Grade Change: Tracking Online Education in the United States*, by I. Elaine Allen and Jeff Seaman, January 2014)

"There were 412,000 more online students in fall 2012 than in fall 2011, for a new total of 7.1 million students taking at least one online course. This year-to-year change represents the smallest numeric increase in the past five years. The growth rate of 6.1 percent in students taking at least one online course also represents the lowest percentage increase since these reports began tracking online enrollments. …"

"While the growth rate may be slowing, it is still many times larger than the growth rate of the overall higher education student body. The increase from 1.6 million students taking at least one online course in fall 2002 to 7.1 million for Fall 2012 represents a compound annual growth rate of 16.1 percent. For comparison, the overall higher education student body has grown at an annual rate of 2.5 percent during this same period—from 16.6 million in Fall 2002 to 21.3 million for Fall 2012. …"

"Previous reports in this series speculated that the slower rate of growth in the number of students taking at least one online course might be the first sign that the rise in online enrollments was reaching a plateau. The most recent results provide further support for this view, with a smaller increase in the absolute number of additional online students and the lowest ever growth percentage.

"The evidence continues to mount that a plateau for online enrollments may be approaching, but there is no evidence that it has yet arrived.

"The proportion of higher education students taking at least one online course now stands at 33.5 percent. For comparison, this rate was 32.0 percent last year, and slightly less than ten percent in the first year of this study (Fall, 2003). The proportion has continued its steady increase almost linearly over this eleven-year time."

Endnotes

[1] From the May 8, 2014, *Austin American-Statesman's* "PolitiFact" column:
The state demographer, Lloyd Potter **…** counseled by phone that more than 1,000 people a day may have moved to Texas from other states and countries from July 2012 through June 2013, but plenty of people also left, according to U.S. Census Bureau estimates. Potter noted by email that net migration over the 12 months—people moving in less people moving out—totaled 177,715. "Dividing that by 365, we estimate that there were on average 487 net migrants to Texas each day," Potter emailed.

[2] From the Texas Higher Education Coordinating Board's web site :
"The Enrollment Forecast indicates that, if current patterns persist, Texas public and independent two-year and four-year institutions will grow from the 1.44 million enrollees in fall 2012 to 1.50 million in 2015 (or 525,000 students more than in 2000). If true, the state would be about 100,000 students short of the 2015 Closing the Gaps goal. To begin the process of planning and preparing for the years beyond 2015, this report also estimates enrollments through 2020, which are predicted to be 1.58 million. (See Tables 1 and 2.)"

"The projections in this report are relatively similar to the January 2011 Forecast. The 1.50 million enrollments projected for 2015 are about 10,000 higher than projected in 2011, and the 1.58 million students for 2020 is 10,000 fewer than the earlier 1.49 million estimate primarily due to changes in demographic projections.

"For public universities, fall 2012 enrollment totaled 577,000 students, or 92,000 more students than in fall 2005. For the five-year period from 2010 to 2015, enrollments are projected to grow by 7.6 percent overall to 600,000 students, and then by 5.0 percent to reach 630,000 students in 2020."

[3] See Appendix A, "History of Tuition Revenue Bonds."

[4] "Thirteen Reasons Colleges are in This Mess," *The Chronicle of Higher Education*, March 13, 2009.

[5] Paul Courant et al. "Budgeting with the UB Model at the University of Michigan" (Ann Arbor, MI: University of Michigan, 2000).

[6] "Higher Education Cost Efficiencies," Report of the Texas Higher Education Coordinating Board (1 Nov. 2010) 3-4, 37.

[7] Vance McMahan and Mario Loyola, U.S. Chamber of Commerce and Institute for a Competitive Workforce; "College 2.0: Transforming Higher Education through Greater Innovation and Smarter Regulation" (May 2011) 7.

[8] Thomas K. Lindsay, Texas Public Policy Foundation, "Higher Education Affordability," *Legislators' Guide to the Issues* (2013).

[9] Scott Carlson, "Campus Officials Seek Building Efficiencies, One Square Foot at a Time," *The Chronicle of Higher Education,* Section: Money & Management Vol. 55, Iss. 32, Page A1 (17 Apr. 2009).

[10] Ibid.

[11] Ibid.

[12] Ibid.

[13] Ibid.

[14] Ibid. *The Chronicle of Higher Education* report goes on to mention that the reduced scheduling for class times "might also be a response to quality and campus culture. Research shows that college-age students soak up less information in early-morning hours, and Penn State's administration has pushed for more midday classes. Even the student newspaper called for the abolishing of 8 a.m. classes."
At the same time, others rejoin that "students, who will have to show up for jobs in the real world someday, should just get used to waking up early."

[15] Ibid.

[16] "How Space Gets Split Up": The amount of space and the way it is divided vary widely from institution to institution. Here is a rough estimate of how space is divided at big, public research institutions. The example below does not count hospital space.

Health care	1%
Classrooms	3%
Instructional labs	5%
Study/library space	7%
* Special use	9%
** General use	9%
Research labs	10%
† Institutional support space	11%
Residential	22%
Office space	23%

* Learning labs, computer labs, and other special-use instructional spaces
** Student unions, auditoriums, clubs
† Police space, space for mainframe for academic computing, etc.
Source: Scott Carlson, "Campus Officials Seek Building Efficiencies, One Square Foot at a Time," The Chronicle for Higher Education (17 Apr. 2009).

[17] Ibid.
[18] Ibid.
[19] Ibid.
[20] The University of Texas System's Framework for Advancing Excellence provides good groundwork for addressing the issue of space utilization, and to ensure that new construction projects are not introduced unless necessary. This is an issue that many universities need to address, and the University of Texas System is taking steps in the right direction by addressing the issue in the recently laid out Framework. Although classroom space may be at a premium in the middle of the day and the middle of the week, are those same spaces in high demand at 8:00 AM on a Monday morning or on Fridays or the weekend? If capacity is an issue, universities need to ensure that there is indeed a genuine lack of suitable space. Alternative methods of measuring "capacity" must be explored by universities in this tough budget climate, especially before tuition revenue bonds are proposed to the Legislature.
[21] Ibid.
[22] Were the college-tuition affordability and student-loan debt crises not enough to compel universities to maximize their use of existing space, there has of late come another claimant in the space utilization debate—the American College & University Presidents Climate Commitment, "a pledge to work toward climate neutrality in terms of greenhouse-gas emissions." As noted in Scott Carlson's *Chronicle of Higher Education* report, a number of colleges that have signed the Presidents Climate Commitment also have plans for major building projects. Their resulting dilemma: "Every new building will add to the university emissions." Philip Parsons of Sasaki Inc. sums it up: "The biggest challenge that all the institutions that have signed the Presidents Climate Commitment face is growth in square footage. If they can't contain that, they are going to find it impossible to meet the Presidents Climate Commitment."
[23] Sara Lenz, "From wheat field to innovator: how BYU-Idaho is changing the landscape of higher education," *Deseret News*, (the second in a three part series) 16 Oct. 2011. Part one of the series can be found here. Part three of the series can be found here.
[24] Ibid.
[25] See Appendix B: Brigham Young University-Idaho's "Three Track System."
[26] Ibid.
[27] Ibid.
[28] Ibid.
[29] Ibid.
[30] Margaret Spellings, Speech to the Economic Club of Indiana (14 Sept. 2012).
[31] "25 Ways to Reduce the Cost of College," report by the Center for College Affordability and Productivity (Sept. 2010).
[32] This sub-section draws from Thomas K. Lindsay's Research Study, "The Future Face of Higher Education: Online Learning in the New Economy," Texas Public Policy Foundation (2012).
[33] Clayton M. Christensen and Henry J. Eyring, *The Innovative University: Changing the DNA of Higher Education from the Inside Out* (San Francisco, CA: Jossey-Bass, 2011).
[34] Richard A. DeMillo, *Abelard to Apple: The Fate of American Colleges and Universities* (2011: Massachusetts Institute of Technology).
[35] Terry M. Moe, John E. Chubb, *Liberating learning: technology, politics, and the future of American education* (John Wiley & Sons, Inc. Published by Jossey-Bass, 2009).
[36] *Abelard to Apple*, x.
[37] Clayton M. Christensen, Michael B. Horn, and Curtis W. Johnson, *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns* (New York: McGraw Hill, 2008).
[38] Cited in "College for $99 a Month," by Kevin Carey, *Atlantic Monthly* (Sept./Oct. 2009).
[39] *Abelard to Apple*, x.
[40] According to the Institute for College Access and Success report titled, *Student Debt and the Class of 2010*, the class of 2010 graduated with an average of $25,250 of debt, and faced an unemployment rate of 9.1 percent. According to the Project on Student Debt, students graduating in 2012 will average $29,000 in outstanding loans, which, with interest, will approach $40,000.
[41] Online Learning Consortium, *Going the Distance: Online Education in the United States, 2011*.
[42] Ibid.
[43] The latest numbers on the growth in online education in the United States are found in the Babson Survey Research Group's *Grade Change: Tracking Online Education in the United States*, by I. Elaine Allen and Jeff Seaman (Jan. 2014) the relevant of portion of which can be found in Appendix C.
[44] Vance McMahan and Mario Loyola, U.S. Chamber of Commerce and Institute for a Competitive Workforce; "College 2.0: Transforming Higher Education through Greater Innovation and Smarter Regulation" (May 2011).
[45] Sara Lenz, "From wheat field to innovator: how BYU-Idaho is changing the landscape of higher education."
[46] Ibid.
[47] Ibid.

[48] Regarding the question of the quality of online learning versus that which takes place in a brick and mortar setting, *see* Thomas K. Lindsay's "The Future Face of Higher Education: Online Learning in the New Economy," which argues the following:

In 2009, the U.S. Department of Education published a review of 44 studies evaluating post-secondary students. The Department report concluded that "students who took all or part of their class online performed better, on average, than those taking the same course through traditional face-to-face instruction." In its concluding section, the report's authors are quick to qualify the above statement with the following: "When used by itself, online learning appears to be as effective as conventional classroom instruction, but not more so. However, several caveats are in order. Despite what appears to be strong support for blended learning applications, the studies in this meta-analysis do not demonstrate that online learning is superior as a medium. In many of the studies showing an advantage for blended learning, the online and classroom conditions differed in terms of time spent, curriculum and pedagogy. It was the combination of elements in the treatment conditions (which was likely to have included additional learning time and materials as well as additional opportunities for collaboration) that produced the observed learning advantages."

It is important to note that the Department report next qualifies its own qualification: After appearing to walk back from the conclusion that "online learning is superior as a medium," the reports adds, "At the same time, one should note that online learning is much more conducive to the expansion of learning time than is face-to-face instruction." That is to say, the Department report is reluctant to grant online learning any superiority other than that it is more conducive than face-to-face learning to "the expansion of learning." Some wonder whether this distinction constitutes a true difference.

In any event, the Department report is far less guarded when it comes to the superiority of blended learning over face-to-face instruction: "In recent experimental and quasi-experimental studies contrasting blends of online and face-to-face instruction with conventional face-to-face classes, blended instruction has been more effective, providing a rationale for the effort required to design and implement blended approaches."

A more recent analysis has far fewer reservations. "When technology is used, it boosts student achievement," writes John E. Chubb in the April 2012 study, *Education Reform for the Digital Era*, prepared for the Thomas B. Fordham Institute. While his focus is on K-12 education, Chubb's observations are equally applicable to higher education: "Online programs allow schools to customize instruction to individual student needs. They also offer students one-on-one tutoring by teachers working remotely. … In sum, technology can bring many instructional tools to the student that a regular classroom teacher simply cannot."

In the same report, Tamara Butler Battaglino, Matt Haldeman and Eleanor Laurans write, "The traditional school model spends over half of its budget on labor, with the majority of the remainder allocated to school operations." They add, "The promise of online learning is twofold: More-effective uses of technology have the potential both to improve student outcomes and to create a more productive educational system."

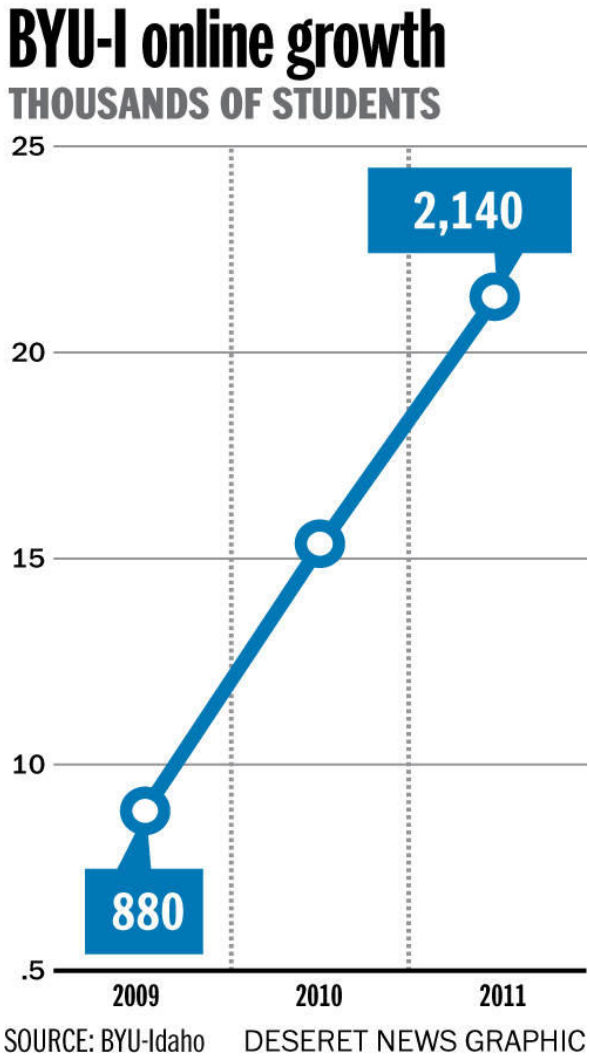
In sum, online learning's benefits consist, first and foremost, in the greater flexibility and customization offered. In addition, students have a far-wider range of choices of teachers and subjects than they do with traditional brick and mortar education. Consider also those students who live in remote and/or crime-ridden areas. For them, online education offers perhaps the only opportunity for a way out and up.

No less revolutionary, as one study recently documented, online education has the capacity to alter the criteria by which students ascend to higher grade-levels, "shifting the focus from 'seat-time' to a competency or mastery-based approach." Because of the capacity of online education to customize learning on a scale never before possible, students can "proceed to higher levels as they master subjects," rather than be inhibited through being forced to proceed at the same pace of the rest of the class. Also, "customized learning programs can allow for real-time monitoring and tracking" of progress, which allows for timely interventions in those instances when a student falls behind.

In addition to freeing up teachers' time for more individual-level work with their students, online education's greater efficiency holds out the promise of reducing the cost of higher education. In *Liberated Learning*, Moe and Chubb conclude that, through the use of online learning, "schools can be operated at lower cost, relying more on technology (which is relatively cheap) and less on labor (which is relatively expensive)."

[49] Ibid.
[50] Ibid.
[51] Ibid.
[52] Ibid.

[53] See graphic below.



[54] Ibid.

[55] According to a recent report, Purdue University in Indiana has begun "an increased emphasis on Internet classes. Already, Purdue has converted 63 of its larger courses to a hybrid model in which students watch most lectures online. Classes are reserved for projects or other exercises where students have to demonstrate what they've learned." From "Mitch 'The Blade' Daniels Takes on Higher Ed," in Bloombergview.com, by Paula Dwyer (19 Sept. 2013).

[56] Thomas K. Lindsay, "The Future Face of Higher Education: Online Learning in the New Economy."

[57] Ibid.

[58] Texas Higher Education Coordinating Board, "Tuition Revenue Bond Report" (Feb. 2010).

[59] Texas Higher Education Coordinating Board, "Overview: Tuition Revenue Bonds" (May 2010).

[60] Ibid.

[61] Ibid.

[62] Ibid.

[63] Ibid.

About the Author

Thomas K. Lindsay, Ph.D., is director of the Foundation's Center for Higher Education. He has more than two decades' experience in education management and instruction, including service as a dean, provost, and college president.

In 2006, Lindsay joined the National Endowment for the Humanities (NEH) staff as director of the agency's signature initiative, We the People, which supports teaching and scholarship in American history and culture. He was named Deputy Chairman and Chief Operating Officer of the NEH in 2007.

Lindsay received his B.A., *summa cum laude*, in Political Science, and went on to earn his M.A. and Ph.D. in Political Science from the University of Chicago. Oxford University Press published Lindsay's American Government college textbook, *Investigating American Democracy* (with Gary Glenn). He has published numerous articles on the subject of democratic education, many of which have appeared in the world's most prestigious academic journals, including *American Political Science Review*, *Journal of Politics*, and *American Journal of Political Science*.

Lindsay has published articles on higher-education reform in *Real Clear Policy, Los Angeles Times, National Review, Inside Higher Ed, Washington Examiner, Knight-Ridder Syndicate, Dallas Morning News, Houston Chronicle, American Spectator*, and *Austin American-Statesman*, among others. He has just accepted an offer to become a contributor to *Forbes*.

In recognition of his scholarship on democratic education, Lindsay was made the 1992-93 Bradley Resident Scholar at the Heritage Foundation in Washington, D.C.

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