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04.
IS THERE A "THERE" THERE?
Online Education & ArchitectureX
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ABSTRACT
Will online education render the traditional university campus irrelevant? Is there a "there" there when it comes to online education? What makes the flesh and blood, bricks and mortar material realm still relevant – even essential – to education? While online education has brought with it radical transformations to higher education, bringing people together in physical space is and will be essential for student success. The reasons for coming together, however, are changing; institutions must adapt if they are to remain vital. This article examines the risks and rewards that online education presents to the traditional campus as well as the impact that educational models merging online and on-campus learning might have on the traditional campus and beyond. It also identifies potential campus realignments that could bring vitality to a campus through engagement with the regional community, businesses and government as well as the key questions about planning, strategy, branding, and architecture that institutions need to ask themselves in order to determine where they stand in relation to online education.

KEYWORDS: MOOC, competency-based credentialing, flipped classroom, innovation centers, apprenticeship programs

1.0 INTRODUCTION

Is there a "there" there when it comes to online education? If there is a "there" there, what is the architectureX for edX and other online education providers? What are the architectural implications of more and more education materials being placed online for students at traditional universities? These are the questions that sparked this research to determine how architecture might evolve to meet the needs of online education both on the traditional university campus and beyond. In searching for the answers to these questions, it quickly became clear that the "there" in this digitized, dematerialized realm of education is found by looking for what makes the flesh and blood, bricks and mortar material realm still relevant – even essential – to education. So with some irony and a little bit of obviousness, the looking for the "there" in online education became a study of what cannot be done online, or at least not done online well.

These are the early days of online education, even though it started to take root in the 1990s. It has been just in the past two years that the growth of online edu-cation has accelerated, fueled by the interest of major universities, venture investors and the growing access to bandwidth. It has also helped that entities such as the Bill & Melinda Gates Foundation and the National Science Foundation have funded online education programs at various colleges and universities so as to study the effectiveness of online education. While these studies are very much in progress, educational leaders already have high hopes for online education. In a 2012 interview, Stanford University's president John L. Hennessy stated, "I'm a believer in online technology in education. I think we have learned enough about this to understand that it will be transformative. It's going to change the world, and it's going to change the way we think about education.[1]" William G. Bowen, President Emeritus of The Andrew W. Mellon Foundation, stated at a recent conference that, "there is real potential for online learning to reduce inefficiencies in teaching, scheduling, and lost transfer credits…[2]" With 31.3 percent of U.S. college students enrolled in at least one online course in 2010, this online education thing might be here to stay[3].

The meteoric rise of – and hyper-enthusiasm for – online education is perhaps most fueled by a hope that it will bring an end to the "crisis" in higher education. This crisis is defined by high student debt that now exceeds the nation's entire credit-card debt, perceived low return-on-investment of a college degree, a drop in state appropriations to public colleges and universities, a drop in median family net worth (resulting in less money to spend on education), and tuition rates rising four times faster than the rate of inflation[4,5,6]. When viewed from the depths of this crisis, the founders of edX and other such massive open online courses (MOOCs) appear to some as oracle-like beings who can show the way to divine salvation for higher education:

> Already, the hyperventilating has outpaced reality; desperate parents are praying that free online universities will finally pop the tuition bubble — and nervous college officials don't want to miss out on a potential gold rush[7].

There are a lot of speculations regarding the impact online education will have on the traditional college campus. Some say that online education and the benefits it brings will cause most college campuses to crumble in disrepair as they will be obsolete within 50 years[8]. Others argue that online education is a fad – perhaps even an ineffective educational model – that will not lead to the alteration of a single brick on the traditional college campus. A recent Gallup poll even showed that most college presidents do not expect that online education will bring with it any substantial financial or educational benefits[9]. Problems with Massive Open Online Courses (MOOC) that have recently emerged – such as low completion rates and the inability of MOOCs to reach those who do not already have access to higher education – are interpreted by some as a sign that online education is an inferior education model destined to fail.

However, there are some who see a more nuanced future in which optimal learning occurs in a blended online and on-campus experience. While Sebastian Thrun, founder of Udacity, has been quoted as saying recently that his MOOC is a "lousy product" that is not living up to expectations, he went on to clarify in a subsequent New York Times interview that innovation is an iterative process in which "few ideas work on the first try.[10]" Even Jonathan Rees, a Colorado State University-Pueblo professor who was one of the earlier critics of online education, stated that he sees the convolutions that the much hyped MOOCs have undergone since their inception as something of a maturing process that is taking education into a potentially positive direction in which it is not totally online or on-campus,

but somewhere in the middle based on what is best for students. As Rees was quoted as saying, "The MOOC is dead, long live the MOOC.[11]"

While we can only speculate about the future, some of these speculations are grounded in truths about why people will continue to want to occupy physical space with other people to discuss ideas. Certain trends on the ground now, examined in section 4.0, demonstrate that even as there is this rapid shift to the online environment, there is also an emergence of new types of spaces in response to new reasons for people coming together. These spaces represent an online education model that blends the digital and physical worlds. This blended model will not serve everyone. Some institutions as well as some students will reject any forays into the online environment. Some students, out of choice or necessity, will find themselves in an online education model that truly has no "there" there. As explored in section 3.0, these purely digitized models will compete vigorously with some bricks and mortar campuses. For higher education institutions that want their campuses to remain vital centers that succeed in doing what cannot be done online, section 5.0 explores possible directions. Section 6.0 attempts to answer what is architectureX.

2.0 WHAT IS THAT THERE? A BRIEF SUMMARY OF E-LEARNING, MOOCS & SPOCS

Online education fits under a large umbrella called "E-learning." E-learning refers to a full spectrum of activities that leverage educational technologies. E-learning comprises numerous types of media that deliver text, audio, images, animation, and streaming video, and includes technology applications and processes such as audio or video tape, satellite TV, CD-ROM, and computer-based learning as well as local intranet/extranet and web-based learning. Even though the technologies associated with E-learning are essential for online education, these technologies can be – and are – deployed throughout various locations in an academic campus to augment more traditional learning environments.

The online offerings of E-learning come in a myriad of different forms by an increasingly large array of providers. Some are private, some are public and some are not-for-profit. There are the large state university programs such as UMassOnline and University of Maryland University College that have provided online courses for well over a decade; the for-profit providers such as University of Phoenix, StraighterLine and Kaplan; the communal online learning sites such as CodeAcademy;

the not-for-profits like TED Talks and the teacher who teaches math well on YouTube (and now leads the Khan Academy); and of course the MOOCs. Some providers such as UMassOnline have long offered full-fledged degrees for their online offerings. The MOOCs provide certificates for course completion but, some are beginning to provide credits or even degrees from accredited institutions. Some for-profits are regarded as providers of a public good by delivering high-quality education to those who cannot attend a traditional college. Some of the for-profit providers are considered diploma mills.

The Massive Open Online Course, or MOOC, has been getting most of the attention as of late because of the speed of its rise and huge numbers of people who enroll in the courses. Anyone with access to a computer and an internet connection can enroll. At last count, over seven million people were enrolled in Coursera[12]. While there has been much discussion that these free courses would democratize education by reaching out to the underserved throughout the world, a recent survey has shown that most people enrolling in MOOCs are already well educated degree holders[13].

The online class itself typically consists of a short 8 to 12 minute lecture interspersed with quizzes or exercises. Feedback is instantaneous[14]. There are now dozens of MOOC providers, but Coursera, Udacity and edX are the most prominent. Coursera and Udacity are both for-profit and were founded by individual professors from Stanford striking out on their own. EdX is a non-profit that was founded by MIT and Harvard. All three of these MOOCs have now partnered with various other colleges and universities around the world. The MOOC market, already quite large, is only going to get bigger as the MOOC providers set their sights on serving a wide spectrum of people including:

> … global learners in developing nations who lack higher-education infrastructure and access to the best class opportunities; U.S. college students, particularly at hard-pressed public community – and state – college systems, who need basic courses, who are being shut out of over-enrolled classes required for their degree sequences, or who simply need cheaper alternatives for higher education; and adult learners seeking practical, career-focused skills[15].

When asked in a recent interview about what sets edX apart from other MOOC platforms, edX president Anant Agarwal responded "we have a fundamentally different mission…. We're non-profit. We're open source. Our technology is for everyone. We have a commitment to campus learning.[16]" While edX is in the MOOC business, their VP Howard Lurie clarified that edX is best described as a learning company that acts as a portal to educational materials offered by its partner institutions including universities and academic publishers. EdX's main mission is to reinvent and enhance on-campus learning rather than replace it. While the MOOC arm of edX already has enrolled almost 700,000 in less than a year, increasing their enrollment is not their primary focus; increasing the quality of education is. To that end, they have launched various pilot programs for research and are engaged in partnerships to customize courses with each of their partner schools. With their partner schools they are in process of establishing research centers for better teaching and learning. These partnerships have led to what Anant Agarwal, edX president, calls a SPOC or "small private online course." These SPOCs blend online materials available only to students enrolled in a class with classroom interaction with professors. Professors can personalize the class with their own readings and assignments[17].

While there are varying opinions about the benefits that come with online education, there seems to be a consensus that the reevaluation of pedagogical methods triggered by the spectacular rise of MOOCs is a good thing. After a recent online education conference, MIT President L. Rafael Reif stated, "I couldn't have imagined circumstances in which you could get all these communities together to discuss education.[18]" People learn by doing and edX is trying to build a platform where students "do," according to Howard Lurie at edX. Even though edX is just one year old, Johannes Heinlein at edX stated that they have gathered enough "Proof Points" to show that an online course broken into segments followed by personal engagement by the student truly can enhance learning. EdX is interlacing homework with attention spans. Such a structure provides personalization, immediate feedback and resonates with the minds of younger people for whom the game-ification of learning is familiar. As Daphne Koller, co-founder of Coursera, recently stated in a New York Times article "we must leverage, not fight against, the changing tide of the preferences of a new generation – the digital natives.[19]"

Long before the rise of the MOOCs and SPOCs, research showed that conventional classroom-based group instruction is the least effective learning condition when compared to one-to-one tutoring and mastery learning. If, as there is strong reason to believe, MOOCs can evolve to become personalized "precision-built courseware" akin to a one-to-one tutoring expe-

rience, they will lead to stronger student performance and be a superior method of educational delivery when compared to the traditional classroom[20]. Someday very soon it might be considered irrational for students not to participate at some level in online education if they want the best educational experiences. It might be seen as irresponsible for higher education institutions to not offer an optimized blend of both online and on-campus learning opportunities. It is hard to believe that profound changes in higher education are not underway:

> MOOCs represent a postindustrial model of teaching and learning that has the potential to undermine and replace the business model of all institutions that depend on recruiting and retaining students for on-campus studies[21].

3.0 THERE IS NO "THERE" THERE

There are online education models in which students jump back and forth from a digital cloud to a physical classroom or other grounded space. However there certainly do exist other online education models that are untethered to the physical world; there is no "there" there (aside, of course, from the lap in which the laptop is located). Out of choice or necessity, many students will find themselves participating in a pure online education model. This online shift by what is predicted to be a large group of students will be felt most by the middle-tier institutions:

> Why, after all, would someone pay tens of thousands of dollars to attend Nowhere State University when he or she can attend an online version of MIT or Harvard practically for free?[22]

No longer do college campuses provide a service that people cannot find at a better price or at a better quality elsewhere. Scarcity of teachers and limited real-time communication options has been the rational for building college campuses since colleges began to appear in the Middle Ages[23]. Scarcity can no longer hold a college campus together. If having a "there" no longer works to attract students and professors, institutions may begin to regret recent campus construction projects and question the need for new construction projects. "There" does not matter anymore for some students.

3.1. StraighterLine to No There

Burck Smith started putting courses online in 2009 when he launched StraighterLine where students can take general education courses such as Econ 101, Psych 101 and College Algebra at substantially reduced rates when compared to a bricks and mortar program. Students obtain credit for their coursework when they

enroll with one of StraighterLine's partner colleges and universities such as Thomas Edison State College, University of Phoenix, Bay State College, Kaplan University and Kendall College. These courses will transfer to a wide variety of colleges where students can finish their degrees in person or online.

StraighterLine's goal is less about disrupting the physical campus and more about letting students choose the blend of physical and virtual courses that makes sense for the student rather than what makes sense for the school. Even so, StraighterLine does represent a threat to college campuses: StraighterLine enables students to obtain their degrees without stepping one foot onto a campus. Unlike MOOCs, StraighterLine already has in place a revenue-generating business model where students can get college credits much more cheaply than on-campus options. Testing centers are not even safe from Smith: the StraighterLine proctored tests are observed online using a combination of webcams and screen sharing software called ProctorU. Nor is there a "there" there for even a server room because StraighterLine runs entirely on the Google Cloud Platform. Smith does not see himself as the bad guy here. In fact, he describes the services he provides as part of the solution to the higher education crisis. For a lot of students who cannot or do not find their way to a physical campus, StraighterLine and other pure online providers are the solution.

3.2. No Time (or Money) There

The dematerialization of education is fueled increasingly by growing doubts that time spent sitting in a physical classroom should continue to be the prevailing unit of measure for higher education. For more than a century, the credit-hour has been the universal measurement for the duration of time students occupy a classroom. Also known as the Carnegie Unit, the credit-hour was introduced in 1906 by the Carnegie Foundation for the Advancement of Teaching. Now Carnegie is the main proponent for replacing the credit-hour. What that alternate standardized unit should be is still to be determined, but the current front-runner is some sort of competency measure. For Pamela Tate, president of the Council for Adult and Experiential Learning, this re-evaluation of the credit-hour is long overdue: "We believe strongly that learners should be assessed based on what they know and can do, not just time spent in a classroom.[24]"

Time spent in physical space as a measure of learning is being questioned not just because the measurement of time seems to be an imprecise method of knowledge assessment, but also because many students cannot

afford to take the time to sit in a classroom. Time is money and less time in class saves money. Even President Obama recently proposed that colleges consider competency-based degrees as a way of reducing cost[25]. In March 2013 the Department of Education asked that colleges suggest programs for providing financial aid that do not rely on the credit-hour. The response they got was that it is time to embrace competency-based education. A December 2013 report by President Obama's Council of Advisors on Science and Technology even more explicitly stated that accreditors brandishing the credit-hour not stifle innovation within the nascent online education industry as the industry experiments with ways to provide credit to students[26].

All of this pressure on the credit-hour may signal that it is in its final hours. Competency-based programs that save students both time and money are now emerging from all directions. Institutions such as College for America and Capella University have competency assessment degree programs approved by the Department of Education[27]. The State of Texas is working with faculty at South Texas College and Texas A&M University-Commerce to develop an online competency-based degree program costing between $6,000 - $13,000 total. The University of Wisconsin also has a competency-based degree program called the Flexible Option[28]. For even less money than the Texas program, students can obtain a $4,000 M.B.A from the competency-based online UniversityNow[29]. If $4,000 is too much for a degree, there is now the not yet accredited University of the People that offers the only tuition-free online college degree program. Its operating expenses are covered by donations from such entities as the Gates Foundation and the Carnegie Corporation. With just 14 paid staff members, more than 300 volunteers help run the university[30].

In a recent New York Times article, Clayton M. Christensen and Michael B. Horn compared traditional colleges to the 19th century transoceanic sailing ship companies that could not compete against the disruptive innovation of the steamships. While some colleges are now supplementing what they offer with online courses and even flipping their classes with lectures viewed online and class time reserved for higher level engagement with students, this alone is not enough of a change:

> *Like steam, online education is a disruptive innovation — one that introduces more convenient and affordable products or services that over time transform sectors. Yet many bricks-and-mortar colleges are making the same mistake as the once-dominant tall ships: they offer online courses, but are not changing the existing model. They are not saving*

students time and money, the essential steps to disruption. Though their approach makes sense in the short term, it leaves them vulnerable as students gravitate toward less expensive colleges[31].

The gravitational pull of competency-based online programs for students with limited time and money is strong. As the availability and acceptability of these time and money saving programs increase, the end of the credit-hour draws closer. Students no longer need to be "there" in a classroom on a college campus as the clock ticks to reach where they are going.

3.3. Networking No There

College campuses have long provided optimum opportunities for socialization and networking, but even these on-campus advantages are being transferred quickly to the online environment. Dates can be found on Match.com and Chemistry.com. Now jobs can be found on MOOCs.com. On-campus networking is being rendered irrelevant as MOOCs can match talented online students with prospective employers[32]. Coursera Career Services, launched by Coursera in December 2012, provides students with an option to appear in a database that employers can peruse. Udacity is also exploring this recruitment model in which companies pay to access high-achieving students as a potential revenue model[33]. Students increasingly will view a "there" on campus irrelevant for their personal and professional networking:

> *If MOOCs can be used to create a system that rewards demonstrable competency, then they will further undermine the value of campus-based networking. When used to connect talent directly to prospective employers, MOOCs can circumvent one of the few remaining rationales for seeking a traditional college experience[34].*

3.4. Not Enough "There" There

Overcrowding and lack of resources at some institutions has meant that there is not enough "there" there for all of their students. When faced with the problem of how to provide remedial courses to 50 percent of students entering the California State University (CSU) system unable to meet the basic requirements for elementary math and English, Gov. Jerry Brown contacted Udacity for help. A pilot program with Udacity and San Jose State was established and so was born the first collaboration between a MOOC provider and a university[35]. Udacity even established a 24-hour online mentoring service to assist these students in these pure online course offerings[36].

California's problems with lack of classroom space extend beyond just the entering students needing remedial courses; existing CSU and community college students are finding that there are not enough seats in courses they are required to take as part of their degree programs. So in hopes of alleviating this shortage of classroom space in these oversubscribed classes, Senate Bill 520 (SB520) was introduced in February 2013 that would allow online education providers including MOOCs and for-profit companies to provide courses for credit to California public college and university students. Not everyone sees SB520 as a good thing. The Berkeley Faculty Association started an online petition against the bill. Robert Meister, Chair of the Council of UC Faculty Associations, stated that "it's the wrong solution to the wrong problem." The real problem is lack of adequate funding[37]. The New York Times Editorial Board also did not think highly of SB520:

Online classes are and will be part of the educational mix, in California and elsewhere. But they cannot be counted on to revive a beleaguered public system whose mission is to educate a great many freshmen who need close instruction and human contact to succeed. To broaden access and preserve what is left of the public university, California lawmakers will need to change budget priorities that have been moving in the wrong direction for a long time[38].

The protests against SB520 worked: the bill has been put on hold until at least August 2014[39]. Proponents of SB520 were also not helped by the poor results of the San Jose State University partnership with Udacity to provide introductory college classes to struggling high school students. With pass rates between 23.8 and 50.5 percent – worse than rates from students in a physical classroom – from the Spring 2013 pilot program, San Jose decided to suspend the program[40]. Whether these setbacks for SB520 and the San Jose State–Udacity partnership are a good or bad thing is hard to determine at this point. Perhaps with some tweaking, the collaboration with Udacity had the potential to provide more CSU students with an opportunity to pass the basic requirements and be eligible to attend classes on a physical campus. SB520 could have enabled more students to graduate on time because they do not have to wait another semester for a seat in a class. It could also have meant that struggling students are not given the personal attention they need and that some students miss out on interaction with faculty. The failure rates of the San Jose State pilot program clearly pointed out that the needs of struggling students were not being met. SB520 most certainly would have resulted in State money flowing to online education pro-

viders, leaving less money for the physical campuses throughout California. There is not enough "there" there now and with SB520 there might continue to be less and less there in the future.

While SB520 seems unlikely ever to pass, it already has had a significant impact on the California system. The efforts to pass the bill demonstrated that if an institution cannot provide enough resources to their students, online education providers are poised to fill the gap. Even though the Udacity collaboration ended with a thud in 2013, there might be another online provider in the not too distant future who pushes their way into the university. EdX, for example, is running a separate pilot program at San Jose State that is delivering promising results. So in response to the perceived threat of these external online education providers, University of California System, CSU and the California Community Colleges now plan to launch their own online courses[41]. Perhaps the California system will be able to achieve all that SB520 had set out to achieve while keeping State money within the school system. Such a model has been highly effective for the University of Massachusetts system with UMassOnline pumping millions of dollars into the UMass system every year. If, however, California fails to resolve their classroom shortage problems either through the development of their own online program or even through construction of more physical classrooms, external online providers will be quick to offer solutions to the lack of "there" there.

4.0 THERE IS A "THERE" THERE
While there are providers of online education that have no need for the physical world, let alone the college campus, there are others who view the intertwining of online education with the physical campus as a way to bring success not just to the individual student, but also to the institution as a whole. Their aim is not to replace the campus with the computer. Jack M. Wilson, the founder of UMassOnline and President Emeritus of the University of Massachusetts, has shown in his professional life that a commitment to both online education and the campus leads to successful outcomes at multiple levels. After serving as CEO of UMassOnline for several years, Wilson went on to be the President of the University of Massachusetts for eight years during which he approved numerous new construction projects for the university. These were construction projects that still made sense to an online education leader. Wilson noted that online education is changing the campus, but it will not destroy the campus. The campus still matters.

So it is proposed by some that an optimum blend of both on-campus and online learning experiences gives the student the best opportunity for success. While edX hopes to attract many students to its online offerings, edX also promotes the campus as a place of learning. In a March 2013 interview, Johannes Heinlein, Director of Strategic Partnerships and Collaborations at edX, stated that there will always be a value in face to face interactions. Campuses are places to come together to engage with intellectually driven people. Engagement has proven to be crucial for student retention[42]. Great facilities encourage students to spend time on campus, which leads to greater engagement with others, which leads to greater student retention and greater student success. As purely online programs grapple with poor completion rates, institutions should capitalize on the power of the campus to facilitate student engagement and student graduation. To highlight this advantage that campuses have over purely online programs does not mean that campuses should not change; online education can bring with it a much needed enhancement of the student experience on campus. For example, online education can positively transform the way students and professors use the classroom. Salman Khan, founder of the online Khan Academy, highlighted this potential at a recent conference:

> *Khan believes that online learning will allow professors and teachers to leverage the physical space better. When rote learning can be replaced by online technologies like those provided by Khan Academy, the classroom can be used for more high level discussion*[43].

At the level of the institution, successful outcomes can be achieved through a holistic view of online education and the mission of the institution. The University of Massachusetts is a success story when it comes to this very kind of holistic thinking. Jack M. Wilson noted that online education provides another way for UMass, a public institution that emerged from the Morrill Land-Grant Act, to fulfill its mission to bring education to the people. Providing courses online has enabled UMass to reach students beyond Massachusetts. This broader reach has led to the lowering of costs to all students as the university has been able to distribute their product more widely. UMassOnline has allowed the university to scale up their course offerings without expanding the physical campus. The additional courses offered online have enabled UMass to hire more faculty. These additional faculty members in turn bring in money from research grants or in some cases money from the commercialization of their research. This money generated by the faculty has made investments in research build-ings viable because of the revenue generated by those research buildings. Beyond just research buildings, Wilson noted that UMassOnline has been very good for the physical campuses of the University of Massachusetts. UMassOnline has created a revenue stream of $70 million per year. Before UMassOnline, UMass had not built a residence hall in more than 30 years and they had deferred maintenance on many of their campuses. UMassOnline enabled UMass to focus on their physical campus infrastructure. According to Wilson, UMassOnline supports a traditional campus environment and enables UMass to become a major research institution all while bringing the cost of education down for students.

Success for both students and the university is also what some universities are hoping for with programs that convert online students to on-campus students. In their MOOC2Degree program, these universities are using MOOCs as part of a way to lure students to their bricks and mortar campuses. These universities offer free introductory for-credit online courses with the expectation that if a student passes one of these free courses, they will want to complete the degree program on campus[44]. If the MOOC2Degree program is a success, it will convert digital students into flesh and blood students occupying real campuses. Such a conversion of digital students to physical students was part of the rationale for the Udacity-San Jose State partnership. In providing online remedial classes to high school students through Udacity, those students – it was hoped – would transform into full-fledged, college-ready students occupying the very real San Jose State campus. Sebastian Thrun, founder of Udacity, argues that through such a program, MOOCS actually will increase enrollment at traditional physical campuses by increasing the number of students eligible for college:

> *There's a distinction that people often don't make… which is whether these classes reach existing students and take away business, or whether they reach new students and add to the business?*[45]

The merging of online and on-campus learning has the potential to bring forth successful outcomes for both students and institutions. With the merging of the digital and physical, a wide spectrum of physical transformations can come to the college campus and beyond. Some blended models are successful without any changes to the traditional campuses. Other models comprise an infusion of technology and more flexible furnishings into existing campus spaces. Some have led to gatherings of people in spaces beyond the campus. In all of the blended models, there is a "there" there by definition.

4.1. There are Flipped & Blended Classrooms

The blended classroom is one that straddles both the online and on-campus worlds. In most cases, these blended classrooms are considered "flipped" because students first absorb new information through online lectures and exercises, then come to class for discussions and to apply what they know in project-based learning exercises. The professor can tailor the class based on the feedback of how students performed on their online assignments. Blended classrooms are growing in appeal and, according to Johannes Heinlein at edX, they represent the future for edX. Howard Lurie at edX explained that the lecture hall is the 14th century model of education; the blended classroom is what makes sense now.

Positive results are emerging out of the blended and flipped classrooms such as the edX pilot program at San Jose State University (not to be confused with the Udacity-San Jose pilot program). San Jose students viewed online materials for this "Circuits and Electronics" pilot class and they also participated in classroom-based instruction led by their San Jose professors. San Jose saw the fail rate drop from 40 percent to 9 percent for this class[46]. Positive results also are being reported out of Clintondale High School, the first entirely "flipped school," with failure rates dropping and graduation rates rising. As with the San Jose program, Clintondale students view lectures at home and then come to class to do projects and exercises with other students. Flipping is "a potential model of how to use technology to humanize the classroom.[47]"

EdX has other small private online course (SPOC) pilot programs featuring the blended model at MassBay Community College and Bunker Hill Community College. In these two programs, community college faculty are adapting edX courses for their students who, when compared to typical MIT or Harvard students, are generally older and are working full-time. Students access the course material online and then come to class to discuss the materials with their MassBay or Bunker Hill teachers. Such a model has required no physical modifications to these community college classrooms. Here a new model of learning can be applied to the existing physical campus of a community college without any large infrastructural investment. As with the San Jose pilot program, the MassBay class is already seeing positive results: 18 out of 19 students passed the midterm and 16 of those students received an A. In the purely online version of the class, only 22 percent of students passed the midterm[48]. Clearly it helps to have a "there" there.

4.2. There are Team-Based Project Rooms

Burck Smith, founder of StraighterLine, stated in a recent interview that the blended classroom is not the answer because it is still predicated on the fact that the class is the organizing force. With the rise of online education, Smith argued, the class no longer offers a strong justification for gathering people in space; everything typically conveyed in a class can now be transmitted online. Instead of the class, Smith suggested the group project be what pulls people together in space. Smith envisions an environment where students are committed to working on these projects and are reviewing other students' projects. Everyone is evaluated by their mentors. There are already several examples of successful project-based learning in action: Franklin W. Olin College of Engineering's project-based curriculum challenges students to solve real-world problems posed by corporate sponsors; Hampshire College's students develop their own projects based on issues they decide they want to explore alone or in groups; Harrisburg University of Science and Technology works with corporate faculty to provide students with project-based experiential components.

4.3. There are Active Learning Classrooms

Traditional classrooms are being overshadowed now by active learning classrooms (ALC). Unlike the traditional classroom that is unidirectional with rows of student desks facing towards the teacher's desk or podium at the front of the room, the new team-based project rooms are multidirectional with groupings of students working together. A typical student grouping could be formed by a round table seating several students and within each student's view are screens for students to share images. This arrangement not only encourages face to face interaction, but also facilitates technological interaction. It is a return to Socratic learning with technology as part of the discussion. These new ALCs can be defined by the following characteristics[49]:

- Tables arranged to support groupings of students
- Technological infusion of projectors, video, accessible outlets, data ports and WIFI
- Multidirectional focus (projection screens and whiteboards could be on multiple walls)
- Layout fosters inclusion of every student
- Flexibility of space facilitates movement and energizes students (everything has wheels)
- Writable surfaces everywhere (tables, walls).

Recent studies show that the active learning classrooms are having a positive impact on learning when compared to the traditional classroom: students in ALCs have higher grades, teachers and students in ALCs have

more discussions (instead of lectures), the ALC teachers move around the room more, and writing surfaces in ALCs are used more by both teachers and students[50]. That these ALCs are proving to be successful educational spaces is evident by the multiple consulting companies such as Strategic Workplaces and Wave Guide that specialize in their layout. Furniture manufacturers such as Izzy+ have whole lines geared towards distance learning and active learning classrooms.

4.4 There is Technological Infrastructure

As the MassBay and Bunker Hill Community College-edX pilot programs show, institutions do not need to invest in a lot of technological infrastructure for their students to participate in online education. The institutions that deploy E-learning activities – including online education programs – throughout their campuses have had to make substantial investments in technical infrastructure and the spaces to house that infrastructure. Control rooms full of equipment racks are needed for supporting various campus locations and beyond with content. Studios are needed for the production of the content. HarvardX, the University's operating entity for the edX initiative, is in the process of hiring production staff such as course-development managers, media mangers and video managers. HarvardX is also constructing new video facilities[51]. As UMassOnline's founder and UMass President Emeritus Jack M. Wilson pointed out in a recent interview, much of this technological infrastructure supports the ethereal cloud rather than the computer labs of yesterday. Wilson stated that the personalization of computing should be the focus for institutions as they move forward.

Recently there even have been large technological investments at the K-12 public school system. Approximately 11 million tablets were sold to schools in 2012. In a pilot program at Barron Park Elementary School in Palo Alto, California, every fifth-grader has an iPad. In one Texas school district, $20 million has been allocated to provide mobile computers to almost all of their 25,000 students[52]. If these sorts of investments are becoming common place in public K-12 schools, those students – "the digital natives" – will expect a technologically infused environment when they attend college[53].

The there "there" is wired… or wireless.

4.5. There are Informal Technologically-Infused Spaces

In addition to the new video facilities, control rooms and high-tech classrooms, A/V consultants such as Wave Guide are also helping their clients develop technologically-infused informal student collaboration spaces. These informal spaces could be the break room, lunch room or any sort of spill-out space. Wave Guide is equipping these spaces with flat screens, recharge stations and wireless connections that can connect to the flat screen in the space. Even when students are "there," they can also be online.

4.6. There are Meet-Ups

Many MOOC students – particularly those who are taking online courses without any connection to a physical university – want the camaraderie and discipline that comes with a study group. Organically these study groups, or "meet-ups," have sprouted up independently from the MOOCs themselves using social media. They could occur in a pub or a Starbucks or just about anywhere else that people can find chairs to sit down in a group. The value of these study groups is becoming evident: students are saying that they are more likely to finish an online course if they are part of a study group that comes together for meet-ups in actual physical places[54].

When asked if edX had any plans to start organizing formal meet-ups for their course offerings, Howard Lurie at edX stated that it is good that these meet-ups happen without edX involvement; edX does not want to be presumptuous about how people in Thailand or Brazil might best study. While edX might help establish study spaces in partnership with NGOs, they do not want to overextend themselves to be organizing world-wide study groups. Regardless of who organizes a meet-up, they are a "there" that has developed in direct response to MOOCs.

4.7. There are Testing Centers

Testing centers have become a major player in the rise of online education. Without proctoring, it is very easy to cheat on an online exam. Pearson's testing centers, located in more than 100 countries, now provide students at edX, Coursera and Udacity with a place to take a proctored exam. However, just when it looked like online education could not be completely untethered from the physical world, ProctorU appeared. ProctorU uses webcams and screen-sharing software to oversee online exams[55]. Physical testing centers are where the three main MOOCs have turned to enable students to validate what they have learned online. Testing centers help to ground an online student's work with the legitimacy that sometimes only a "there" can provide.

4.8 There are Community Center Learning Environments

In his January 29, 2013, State of the City address, Mayor Thomas M. Menino announced the launching of a pilot program with edX. The initiative, called BostonX, would provide free online courses to Boston's community centers:

Imagine a day when our community centers are little campuses in their own neighborhoods, full of vibrant groups of neighbors, exchanging ideas and making progress together. This initiative is a first, important step in that direction. We must connect adults in our neighborhoods with the opportunities of the knowledge economy[56].

Not only would the BostonX project provide the community with access to computers and the internet, but also to professors and students from Harvard and MIT. These Harvard and MIT people potentially would lead discussion groups at the community centers. According to Howard Lurie at edX, the BostonX project is still very much in the design stages, but edX is committed to developing a relationship with their community and helping underserved members of that community. Hopefully this will lead to economically challenged students discovering that if they can do the work of a Harvard class, they should feel like they could go to Harvard. As Anant Agarwal, the president of edX, was recently quoted in the Boston Globe, BostonX could just be the beginning of this wave of CityX's around the world:

The sky is the limit as far as the possibilities here…. My hope is that this idea pioneered in Boston may spread to other cities. One could imagine it all around the world. NewDelhiX. San FranciscoX. I guess LAX is already the airport[57].

The United States government is also thinking big about creating centers for learning around the world. The Bureau of Educational and Cultural Affairs' "MOOC Camp" is described on their website as a new initiative "to host facilitated discussions around massive open online courses at U.S. Embassies, Consulates, American Spaces and other public spaces around the world.[58]" Operating now in 40 countries, the mission of the program is to not just provide learning opportunities for people around the world, but also to facilitate the funneling of students into United States colleges and universities with a network of student advising centers called EducationUSA. These MOOC Camps have the potential to resolve two of the biggest problems with MOOCs: "the lack of reliable Internet access in some countries, and the growing conviction that students do better if they can discuss course materials, and meet at least occasionally with a teacher or facilitator.[59]"

The fact that the U.S. government is creating physical learning spaces around the world shows that it is not enough simply to broadcast free information on the Internet; there needs to be a "there" to truly reach out to people. While the BostonX project is not yet physically "there," the fact that it is in the real planning stages means that this is a "there" that is almost here. These community center learning hubs – along with the flipped and blended classrooms, active learning classrooms, new technological infrastructure, informal technologically-infused gathering spaces, "meet-ups," and testing centers – demonstrate the genuine need for a "there" to be integrated with an online world in order to achieve success for students and the institutions serving those students.

5.0 THE "THERES" THAT COULD BE THERE

Despite online education – or even because of it – academic campuses have the potential to remain vital. In an optimal learning model, bringing people together in physical space will continue to be essential for student success. The reasons for bringing people together are changing and institutions will need to adapt or fade away.

In a recent interview, Johannes Heinlein at edX predicted that online education will replace non-value-added activities that occur on campus: the 800-person lecture hall will no longer provide as high a value as spaces that facilitate closer engagement with faculty and are enhanced by technology. In a separate interview, Nader Tehrani, the Head of the Department of Architecture at MIT, anticipated that because space is expensive, a lot of things that happen in lectures may migrate online. Class time will become the time for valuable face to face contact in seminars or discussion groups. Tehrani predicted that institutions will decide to phase-out some lecture classes so that their budgets can be applied to better learning experiences in smaller groups. Tehrani added that the spatial needs for interfacing with others will vary from discipline to discipline. Some areas of study are easily translated to the online environment. Others require a high level of student engagement in a physical space perhaps equipped with resources available only in that space. There will continue to be needs for science labs, art studios, and music rooms on college campuses.

In addition to the educational merits of campus learning, EdX's Lurie argues that the developmental value that comes from 18 year olds being away from their parents and surrounded by their peers will ensure that there is a future for residential life on campuses. Eighteen year olds probably will still want to live with other 18 year olds 50 years from now. Therfore, the educational and developmental merits of campus learning will continue to be powerful reasons for bringing people together on campuses. However, it cannot be ignored that online education is changing the dynamics of why people come together. Higher education institutions will need to look to what cannot be done online – or at least what cannot be done online well – if they are to remain vital centers. Thomas L. Friedman wrote a hopeful opinion piece on the future of the academic campuses, but he also concluded that universities will have no choice but to change in response to the rise of online education:

> There is still huge value in the residential college experience and the teacher-student and student-student interactions it facilitates. But to thrive, universities will have to nurture even more of those unique experiences while blending in technology to improve education outcomes in measurable ways at lower costs. We still need more research on what works, but standing still is not an option[60].

This section explores some of the possible "theres" that could be there on the college campus of the future.

5.1 There Could Be an Entrepreneurship Campus

Centers to encourage student entrepreneurship and innovation have begun to crop up at some leading universities. These centers serve as examples of the "theres" that could be there for campuses struggling to figure out how to remain vital in the face of rapid technological changes. Entrepreneurial projects need physical space and that physical space needs to facilitate connections between students and private enterprises. As Cornell University President David Skorton stated in the Wall Street Journal when discussing the temporary Cornell NYC Tech space in Google's Chelsea headquarters, "We need to create a new academic model for this time and this place and this industry…. The key, we believe, is engagement between world class academics and companies and early stage investors. Co-location is critical to connecting academic research and industry in a sort of a mixing bowl and seeing what happens.[61]" Even when Cornell NYC Tech moves out of its temporary location at Google, its main mission will continue to be to foster a seamless connection between the university and industry. In this new model, "Cornell NYC Tech is not just a school, it is an 'educational start-up', students are 'deliverables' and companies seeking access to those students or their professors can choose from a 'suite of products' by which to get it.[62]"

Cornell, of course, is not alone when it comes to fostering collaboration between students and professionals. Rensselaer Polytechnic Institute's Lally School of Management established a center for technological entrepreneurship in 1988 that was then renamed The Severino Center for Technological Entrepreneurship in 1999. More recently, Harvard University launched the Harvard Innovation Lab (HI) in 2011 in part to keep up with MIT's Entrepreneurship Center and Stanford's "d.school." Even law schools are opening their own law firms essentially to become "teaching hospitals" for law students with close supervision by professional lawyers and faculty[63].

The interior design of some of these innovation centers aims to foster creativity by conjuring a "start-up" atmosphere. For example, the Harvard Innovation Lab was designed with "exposed ceilings, ventilation, and wiring; bare concrete floors; surfaces coated with whiteboard paint to accommodate free-form sketching and recording of ideas; a kitchen stocked with refrigerated sodas and candy, and an adjoining large-screen television with an Xbox Kinect game controller." In order to promote "structured spontaneity," wheel-mounted furniture and flexible ceiling-mounted electrical connections in common areas were chosen[64].

The impact of these entrepreneurship centers extends far beyond the walls of the institutions that house them. Jack M. Wilson, the co-founder of The Severino Center for Technological Entrepreneurship and President Emeritus of The University of Massachusetts, has long professed that such centers of collaboration play a pivotal role in economic development for entire regions. As Wilson has stated in his October 2012 presentation at the White House, "The path to economic and social development in Massachusetts goes through the University.[65]" According to Wilson, innovation occurs when universities collaborate with industry and capital. From this innovation springs new jobs, new companies and perhaps even new industries.

The emergence of these innovation and entrepreneurship centers and law school "firms" illuminates a path forward for other academic institutions looking to use their physical campuses in meaningful ways that are

distinct from the online environment. Students and professionals need a "there" to work together on entrepreneurial endeavors.

5.2 There Could Be an Apprenticeship Campus

It is time for a reinvigoration of the vocational college to shake it free of the stigma of vocational training as something less than desirable. This is necessary not only for the millions of people out of work, but also for the employers who cannot find skilled people and the country who cannot compete on a global level. Sebastian Thrun, founder of Udacity, is shifting the focus of his MOOC to address the very real need for vocational training by partnering with companies in need of skilled employees. With the corporations not only helping to tailor the training, but also sponsoring it, this partnership is the first viable money making model for Udacity. According to Thrun, this partnership represents the future of college education:

> At the end of the day, the true value proposition of education is employment…. If you focus on the single question of who knows best what students need in the workforce, it's the people already in the workforce. Why not give industry a voice? [66]

Industry has been given a very loud voice in helping South Carolina to develop a skilled workforce. A dearth of skilled workers was what prompted both Tognum America and BMW, two German companies with major facilities in South Carolina, to develop apprenticeship programs in partnership with several area high schools and technical colleges. These programs are good not just for the college offering the training, but also for the entire state. South Carolina clearly knew this when they started their Apprenticeship Carolina program in 2007. The program now includes more than 4,500 students working in over 600 companies[67]. Now South Carolina's main employers are European companies that have been lured to the area in part because of the support the state's colleges have provided in training.

There needs to be a "there" there to train the country's youth if the United States is to grow its industrial capabilities. Even President Obama noted the importance of developing more apprenticeship programs such as those in Germany in his 2013 State of the Union address. However, the number of apprentices has actually been falling instead of rising in recent years. Obama's $100 million grant program to advance technical training in high schools unveiled in November 2013 might not be enough to turn things around[68]. American col-leges and universities have an opportunity here to provide a "there" for these programs that require space for students and industrial experts to come together to work on real life machines making the real life things people need.

5.3 There Could Be a Lifelong Learning Campus

Academic institutions struggling to find new markets in this digital age could look to serving the working and retirement populations in their region. As with the need for more vocational training of the country's youth, there is both a need and a desire for older populations to continue their education. George Mehaffy, the Vice President for Academic Leadership and Change at the American Association of State Colleges and Universities (AASCU), is urging AASCU institutions to reposition themselves to be campuses for lifelong learning, further reinforcing their bond to their respective communities. This makes sense in light of rapid technological advances as well as the fact that people are working later in life:

> Given the pace of technological change and the evolution of the business world, skills obtained early may become obsolete. The new model for workforce education and training is predicated on the need for continuous learning throughout the working life, a process of lifelong learning involving training and retraining that continues well past initial entry into the labor market.[69]

Facilitating the working population's access to the campus would be essential for an institution that wants to be a lifelong learning campus. In addition to providing courses on nights and weekends, an institution could provide episodic educational experience lasting just a few days for particular training needs. In order to compete with online education providers, discounts on courses to regional businesses could also be provided. Such discounts on courses are already provided to Walgreens employees by the University of Phoenix.

Mehaffy highlighted that learning does not stop when people retire. There is a growing desire within the senior citizen population to participate in college classes. Institutions could consider constructing residence halls for senior citizens who want to relive days at their alma mater or just want to live in a vitality-filled campus where they can continue to grow. People will want to be "there" on campus, but institutions need to recognize that these people are increasingly at various stages in their lives.

5.4 There Could Be a "College Experience" Campus

Burck Smith, founder of the online education company StraighterLine, does not think online education will lead to the end of campus learning. Smith still sees value in the campus experience, but this "experience" needs to be redefined and accentuated. In a recent interview with Smith, he suggested that now that courses can be stripped out of the campus and put on the web, campuses need to offer a "college experience" instead of a selection of courses. The price for this "college experience" could be set based on a time period (term, year) instead of credit hours. The experience would include interactions with intellectually curious people and access to a network of students and professors. College would be about bringing people together rather than bringing people into a room to be lectured to.

The transformation – from a place where courses are provided to a place that offers an experience – would necessitate a redefinition of how spaces are used throughout the campus. For example, a professor's office would no longer be a space for the professor to work alone on research; it would instead become a space for student-professor interaction. A classroom would no longer be a space for a unidirectional exchange of information; it would be turned into a space allowing meaningful interactions between people working on projects together.

For this "College Experience" to be a true departure from traditional educational models and to have a true impact on a student's life, it should be about providing students with their own optimized personal experience. The educational institution could be a place that facilitates a customizable path for a student as they move through their studies with the guidance of faculty who are given the time and space to know the student. While online education providers are busy developing software to provide students with self-paced, personalized courses, campus leaders could be creating malleable, customizable spaces where the student experience is something unique and meaningful.

5.5 There Could Be a "Stewards of Place" Campus

The very fact that colleges occupy a place is what separates them from online educational options. That place in which a college occupies is a specific place in the world. That specific place is what makes a college unique from all other colleges. These are simple facts that George Mehaffy at AASCU has been trying to highlight to AASCU's 415 public four-year institutions.

In a recent interview with Mehaffy, he stressed that these middle-tier institutions are most at risk now in the face of online education and must, therefore make the most of their uniqueness of place. Mehaffy said that AASCU has taken on a Paul Reveresque roll recently by trying to impress upon their member institutions the British-are-coming-type situation they face: state funds are declining, expectations are growing, and technology is changing the entire balance of education delivery. Mehaffy is encouraging institutions to remake themselves as "Stewards of Place," a role that would be defined by a strong connection to their surrounding communities, a connection to their region, civic engagement, and local economic development initiatives. A college can no longer be just a place for the storage of 18 year olds; a college must become a steward for the community in which they are located.

It is especially critical to AASCU institutions that colleges play a greater role in their community and region; most of AASCU students come from less than a 100 mile-radius to their college. For most state colleges, their region provides them with a steady stream of students. These students hopefully will graduate and work in the same region as their college. A college needs to invest in the physical place that they occupy because a thriving local economy is mutually beneficial to both the college and the community. Emphasis and reinvigoration of the "there" there is, according to Mehaffy, essential to the survival of middle-tier institutions.

5.6 There Could Be a Migrating Campus

When a university sends their researchers to swim all around a shipwreck in wetsuits and fins, they essentially are creating a temporary satellite "pocket" research campus. Howard Lurie at edX suggested in a recent interview that the shipwreck "campus," linked to the world online through a live video feed, could serve as a model for a future university system composed of connected pockets of activities. These activity pockets could be located anywhere from that shipwreck deep underwater to a corporate headquarters in a Shanghai high-rise. Unlike the typical branch campuses built in communities throughout a university's region, these pocket campuses would be nimble, temporary research sites that would follow the action. These sites would be tied to the university system through online connections.

Such a nimble campus that follows the action is close to becoming a reality when The Minerva Project opens for business in the fall of 2015. Minerva students would migrate to a new city – Hong Kong, Rio de Janeiro, Syd-

ney, London, Cape Town – every semester. As noted in the Minerva website, "The City is the Campus.[70]" While Minerva students will do their coursework online, they will be grounded in urban life. Even though students will have no student center or quad or sports facilities, they also will be grounded in shared housing facilities in each city[71]. As The Minerva Project matures, it will be interesting to follow what emerges as the essential elements of the Minerva "campus." What are the physical components that remain the same as students move from city to city?

With a "Migrating Campus," the university would be defined by its reach to pockets of activity around the world rather than by the walls of a campus. The "there" there would be ever-shifting, but it would be there.

5.7 There Could Be a Porous Campus

A porous campus is one that allows a high conductivity of people in and out of its spaces. All of the possible campus types explored in this section share a high level of porosity. Both the "Entrepreneurship Campus" and the "Apprenticeship Campus" require a porous environment to allow for exchanges between the business world and the academic world. The "Lifelong Learning Campus" must have a porosity that helps students in all phases of life to find their way to the campus. The "College Experience Campus" requires porous spaces that facilitate interaction between students and faculty. The "Stewards of Place Campus" needs to be porous so as to enable connections with the surrounding communities. The "Migrating Campus" has a porosity that enables researchers and students to connect to activities all over the world.

The porosity of an institution will, according to George Mehaffy at AASCU, determine its success in the future. The online environment excels in the facilitation of the flow of ideas and data. The campus environment must excel in the facilitation of the flow of people. If the campus is infused with technological infrastructure, the campus will be an exceptional place that facilitates the flow of ideas, data and people.

Porosity, however, can be at odds with the exclusivity that is so much a part of the value of some institutions. These institutions will need to reevaluate their levels of openness versus selectiveness. Online education brings with it a democratization of education, but some people will still want to obtain a stamp of approval by being selected by a particular elite group. The acceptance letter to elite institutions is "proof" to many students of their worth. Membership in an elite college or intern-

ship program creates social networks that can lead to career and personal success. Architecture has often been used to define these spaces of selectivity. These spaces are designed to exclude thereby creating status thereby creating demand. While Harvard and MIT have opened education to millions around the world through their founding of edX, they are careful not to open the flood gates to these millions at the Harvard and MIT campuses. This limited porosity of these campuses as well as those of their edX partner institutions is spelled out in the edX Terms of Service on the edX website:

When you take a course through edX, you will not be an applicant for admission to, or enrolled in, any degree program of the X University as a result of registering for or completing a course provided by such X University through edX.You will not be entitled to use any of the resources of the X University beyond the online courses provided on the site, nor will you be eligible to receive student privileges or benefits provided to students enrolled in degree programs of the X University.

6.0 CONCLUSION

There is a "there" there. There will be a "there" there. There is an architectureX emerging in response to edX and other online education platforms. Classrooms are no longer unidirectional with focus on the lecturer; they are multidirectional with focus on each team member as well as shared display screens. Hallways are no longer conduits for getting from point A to B; they have nooks and crannies for informal technology-infused gatherings. Libraries are no longer warehouses for books; they have meeting spaces with access to technology. Community centers are no longer just places for Girl Scout meetings; they have spaces equipped with online learning resources for the entire community. Hoever, these examples of technologically-infused spaces for blended learning experiences do not fully define architectureX. ArchitectureX encompasses all of the spaces for learning activities that are not easily replicated online. It is the spaces that an institution preserves and accentuates as part of a reassessment of their core values and mission in relation to the online environment. It is the small seminar room with just a simple wooden table and chairs overlooking the tree-filled quad. It is the turpentine-scented art studio and black countered laboratory. It is the music room with a gaggle of sheet music stands.

The definition of architectureX is ever-evolving because the very definition of "education" is rapidly changing. StraighterLine's CEO Burck Smith argues that the definition of education has in fact never been clearly

defined. Is education defined as a process of content transfer? Or is it about socialization or networking? Is it experiential? Or is education defined by all of the above? Up until now, it is the government sanctioned accreditation of colleges that has defined education. This, as Smith points out, has meant that the definition of education has been self-referential: "Education is What Colleges Tell Us it is." As online providers are pulling chunks of "education" out of the college sphere, the definition of education is undergoing an uncontrolled metamorphosis. This means that the reasons for bringing people together for "education" are also rapidly changing and those reasons will vary from institution to institution. Even though the definition of architectureX will continue to be in flux as the definition of education continues to morph, right now campus leaders could be asking themselves important questions that might point to what architectureX could mean for them. These questions touch upon issues spanning from planning to interior design considerations.

At the planning and strategy level, the rise of online education makes it even more critical that institutions assess the ways in which their assets may best support their mission, vision and values while at the same time ensure the greatest return on capital investments. With the fragmentation of the traditional college experience, most academic institutions will need to streamline their capabilities. How will online education impact the way an institution will optimize their portfolio of properties? Should an institution think of creating satellite campuses around the world? Should branch campuses be closed? Should branch campuses be opened? Should low-ranked university programs be phased out? How will the institution's expansions or contractions impact the economy of their surroundings? What sort of alliances could be made with the regional business community? Questions regarding urban design also come into play at this level. How might urban design projects funded jointly by a city and a university reinforce connections with the community? How might urban design bring students into a city?

At a landscape architecture level, an institution might ask if outdoor spaces encourage interaction and flow. Does the campus landscape design create a porous perimeter that is welcoming to the outside community? Does the landscape design inspire people to gather for outdoor work sessions or private studying? Is there access to technology at these outdoor spaces where people might work? Does the exterior lighting and landscape make the campus safe for people walking to classes in the evening?

At an architectural level, the first question institutions might want to ask is which spaces should be preserved and accentuated as part of their core values and mission in an increasingly digital world. Do they need a new building or can they renovate and adaptively reuse what they already have? What are they going to do with that 800-person lecture hall? Does flexible technological infrastructure need to be interwoven through all of the campus buildings? Are there spaces for intimate personal interaction to counterbalance the massiveness of the MOOCs? Are there places for students to gather for blended learning experiences? Are spaces easily accessible for older students?

At an interior design level, again, considerations need to be made about what needs to be preserved and what should change. Do all the existing chairs with tablet arms encourage collaboration amongst students? Are there loose furnishings throughout campus buildings that encourage people to sit and chat for impromptu conversations? For new Active Learning Classrooms, do the furnishings allow for flexible arrangements? Does a tech start-up-like interior actually foster innovation?

At every level of design, considerations about the institutional brand also come into play. With the fragmentation of the college experience, a strong brand identity will be essential to making physically whole the increasingly atomized, virtual student body. Does an institution's approach to planning, strategy, landscape design, architecture and interior design reinforce the brand identity? Do students feel engaged with the university when they come on campus? Does an institution's online presence weaken their brand identity? Does an online presence strengthen an institution's brand identity? Is the institution's brand based on a level of exclusivity? If so, how much should the institution open itself to the online world beyond its gates? Or is it critical that the exclusivity of the physical campus be reinforced as a way to attract people who want to be stamped exceptional by way of access to this exclusive physical space?

It was questions about brand identity that strongly contributed to Amherst College's recent decision not to join edX. The Amherst faculty asked "why a prestigious liberal arts college devoted to 'learning through close colloquy' should put its name on courses attempting to teach tens of thousands of people at once.[72]" Many other universities are asking themselves these important questions about their mission as it relates to online education and have decided that online education could enhance not only their pedagogical efforts, but also life on their physical campus. When advocating for bring-

ing online education to UMass, UMass-Online founder Jack M. Wilson convinced faculty that academic standards would remain high; the admissions process and curriculum for UMassOnline would be the same as UMass. The online programs would not be a watered down version of UMass.

It is the positing of questions such as those covered in this section that could help campus leaders discover what architectureX means for their institution. As with Amherst College and UMass, this could mean very different things. Regardless of the answers, it is essential that academic institutions at least be asking. Change is coming if not already here. In a 2012 interview, Stanford University's president John L. Hennessy offered advice to other universities grappling with the answers to these questions:

> *… universities have to be willing to change. Universities build on tradition and history, but they also have to be dynamic. And I think that struggle to balance those two opposing forces – to not become too attached to the past in such a way that you can't do something new, or to become too faddish in such a way that you lose your core values – is an ongoing challenge for all institutions. But online education is going to happen; it's not going to wipe everything else out, but it is going to happen. We have to embrace it.*[73]

Institutions need to know where they stand. What is their "there"? What can they do "there" that cannot be done online?

Acknowledgments

REFERENCES

[1] Perry, T., (2012). "John L. Hennessy: Risk Taker", *IEEE Spectrum*, April 24.

[2] (2013). Online Learning and the Future of Residential Education, Report, MIT and Harvard University, Cambridge, MA, Retrieved on 3/2014 from http://onlinelearningsummit.org/documents/summit-report.pdf.

[3] Regalado, A., (2012). "Digital Education: The Big Question", *MIT Technology Review*.

[4] Ripley, A. (2012). "College-is-Dead-Long-Live-College", *Time Magazine,* October 18.

[5] Bowen, W., (2012). "The 'Cost Disease' in Higher Education: Is Technology the Answer?" The Tanner Lectures, Stanford University.

[6] Smith, B., (2013). "Public Mandates, Private Markets, and 'Stranded' Public Investment"*, Career Education Review, January.*

[7] Ripley, A. (2012). "College-is-Dead-Long-Live-College", *Time Magazine,* October 18.

[8] Harden, N., (2013). "The End of the University as We Know It", *The American Interest,* January/February.

[9] Lewin, T., (2013). "Professors at San Jose State Criticize Online Courses", *The New York Times*, May 2

[10] Chafkin, M., (2013). "Udacity's Sebastian Thrun, Godfather of Free Online Education, Changes Course", *Fast Company*, November 14.

[11] Lewin, T., (2013). "After Setbacks, Online Courses are Rethought", *The New York Times*, December 10.

[12] Korn, M. and Levitz, J., (2013). "Online Courses Look for a Business Model", *The Wall Street Journal*, January 1.

[13] Lewin, T. (2013). "Online Courses Attract Degree Holders, Survey Finds", *The New York Times*, November 20.

[14] Pappano, L., (2012). "The Year of the MOOC",. *The New York Times*, November 2.

[15] Lu, R., (2013). "edX's Expansion - and Issues", *Harvard Magazine*, April 10.

[16] Stokes, P., (2013). "A Look Inside edX's Learning Laboratory", *Inside Higher Ed.*, February 22.

[17] Lewin, T., (2013). "Adapting to Blended Courses, and Finding Early Benefits", *The New York Times,* April 29.

[18] Hardesty, L., (2013). "Higher-ed Leaders Meet to Discuss Future of Online Education", Retrieved on 3/2013 from http://www.web.mit.edu/newsoffice/2013/edx-summit-0306.html.

[19] Koller, D., (2013). "Digital Natives: A Defense of the Internet Community", *The New York Times*, September 9.

[20] Mazoue, J., (2013). "The MOOC Model: Challenging Traditional Education", *Educase Review Online,* January 28.

[21] Mazoue, J., (2013). "The MOOC Model: Challenging Traditional Education", *Educase Review Online,* January 28.

[22] Harden, N., (2013). "The End of the University as We Know It", *The American Interest*, January/February.

[23] Smith, B., (2013). "Public Mandates, Private Markets, and 'Stranded' Public Investment", *Career Education Review,* January.

[24] Berrett, D., (2012). "Carnegie, the Founder of the Credit-Hour, Seeks Its Makeover", *The Chronicle of Higher Education,* December 5.

[25] Lewin, T., (2013). "Obama's Plan Aims to Lower Cost of College", *The New York Times*, August 22.

[26] Straumsheim, C., (2013). "Go Easy on MOOCs", *Inside Higher Ed*, December 19.

[27] Kamenetz, A., (2013). "Are You Competent? Prove It", *The New York Times*, October 29.

[28] Lewin, T., (2013,). "Low-Cost B.A. Starting Slowly in Two States", *The New York Times*, October 18.
[29] Kamenetz, A., (2013). "For Profit and People", *The New York Times*, November 1.

[30] Pappano, L., (2013). "The Value in a Free Degree", *The New York Times*, November 1.

[31] Christensen, C. and Horn, M., (2013). "Innovation Imperative: Change Everything", *The New York Times*, November 1.

[32] Mazoue, J., (2013). "The MOOC Model: Challenging Traditional Education", E*ducase Review Online,* January 28.

[33] (2012). "Coursera Creates Service to Help Its Many Students Find Jobs", *Inside Higher Ed*, December 5.

[34] Mazoue, J., (2013). "The MOOC Model: Challenging Traditional Education", *Educase Review Online*, January 28.

[35] Lewin, T. and Markoff, J., (2013). "California to Give Web Courses a Big Trial", *The New York Times*, January 15.

[36] Lewin, T., (2013). "Adapting to Blended Courses, and Finding Early Benefits", *The New York Times*, April 29.

[37] Meyer, L., (2013). "California: Do MOOCs Deserve Credit?", *Campus Technology*, April 30.

[38] (2013). "Resurrecting California's Public Universities", *The New York Times*, March 30.

[39] Rivard, R., (2013). "MOOC Bill Dead for Now", *Inside Higher Ed,* August 1.

[40] Straumsheim, C., (2013). "Scaling Back in San Jose". *Inside Higher Ed,* December 18.

[41] Rivard, R., (2013). "MOOC Bill Dead for Now", *Inside Higher Ed,* August 1.

[42] Painter, S., Fournier, J., Grape, C., Grummon, P., Morelli, J., Whitmer, S., and Cevetello, J., (2013). "Research on Learning Space Design: Present State, Future Directions", Report, Society for College and University Planning.

[43] (2013). Online Learning and the Future of Residential Education, Report, MIT and Harvard University, Cambridge, MA, Retrieved on 3/2014 from http://onlinelearningsummit.org/documents/summit-report.pdf.

[44] Lewin, T., (2013). "Public Univeristies to Offer Free Online Classes for Credit", *The New York Times,* January 23.

[45] Wallis, D., (2013). "Colleges Assess Cost of Free Online-Only Courses", *The New York Times,* March 18.

[46] Stokes, P., (2013). "A Lok Inside edX's Learning Laboratory", *Inside Higher Ed,* February 22.

[47] Rosenberg, T., (2013). "Turning Education Upside Down", *The New York Times,* October 9.

[48] Lewin, T. (2013). "Adapting to Blended Courses, and Finding Early Benefits", *The New York Times,* April 29.

[49] Painter, S., Fournier, J., Grape, C., Grummon, P., Morelli, J., Whitmer, S., and Cevetello, J., (2013). "Research on Learning Space Design: Present State, Future Directions", Report, Society for College and University Planning.

[50] Painter, S., Fournier, J., Grape, C., Grummon, P., Morelli, J., Whitmer, S., and Cevetello, J., (2013). "Research on Learning Space Design: Present State, Future Directions", Report, Society for College and University Planning.

[51] Lu, R., (2013). "edX's Expansion - and Issues", *Harvard Magazine*, April 10.

[52] Metz, R., (2012). "Digital Education: Tablet Makers Pursue Public Schools", M*IT Technology Review*.

[53] Koller, D., (2013). "Digital Natives: A Defense of the Internet Community", *The New York Times*, September 9.

[54] Pappano, L., (2012). "The Year of the MOOC", *The New York Times*, November 2.

[55] Bergstein, B., (2012). "Digital Education: Online Exams - Big Brother Is Watching You", *MIT Technology Review*.

[56] Menino, T., (2013). "State of the City Address", Retrieved on 3/2014 from http://www.cityofboston.gov/mayor/speech.asp.

[57] Ryan, A., (2013). "Menino to Announce Online Education Initiative with Harvard, MIT", *The Boston Globe*, January 29.

[58] U.S. Department of State. "MOOC Camp", Retrieved on 1/3/2014 from http://eca.state.gov/programs-initiatives/mooc-camp.

[59] Lewin, T., (2013). "U.S. Teams Up With Operator of Online Courses to Plan a Global Network", *The New York Times*, October 31.

[60] Friedman, T., (2013). "The Professors' Big Stage", *The New York Times*, March 5.

[61] Walker, J., (2012). "Google Gives Cornell $10 Million in Free Office Space", *The Wall Street Journal*, May 21.

[62] Kaminer, A., (2013). "New Cornell Technology School Tightly Bound to Business", *The New York Times*, January 21.

[63] Bronner, E., (2013). "To Place Graduates, Law Schools are Opening Firms", *The New York Times*, March 7.

[64] (2011). "'Hi' to the Harvard Innovation Lab", *Harvard Magazine*, November 18.

[65] Wilson, J., (2012). "The Innovative University: Higher Education Innovation, and Entrepreneurship In Focus", White House Conference on the Innovative University, Washington, D.C., October 1.

[66] Chafkin, M., (2013). "Udacity's Sebastian Thrun, Godfather of Free Online Education, Changes Course", *Fast Company*, November 14.

[67] Schwartz, N., (2013). "Where Factory Apprenticeship is Latest Model From Germany", *The New York Times*, November 30.

[68] Schwartz, N., (2013). "Where Factory Apprenticeship is Latest Model From Germany", *The New York Times*, November 30.

[69] Karoly, L. and Panis, C., (2004). *The 21st Century at Work: Forces Shaping the Future Workforce and Workplace in the United States,* Santa Monica, CA: The Rand Corporation.

[70] "Minerva Schools at KGI", Retrieved on 1/6/2014 from https://minerva.kgi.edu/.

[71] Kamenetz, A., (2013). "Harvard-Size Ambitions", *The New York Times*, November 1.

[72] Anderson, N., (2013). "As Amherst Rejects Online Lecture Model, Educators Ponder What's to Gain from Trend", *The Washington Post*, May 01.

[73] Perry, T., (2012). "John L. Hennessy: Risk Taker", *IEEE Spectrum*, April 24.