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The evolving university: Disruptive change and institutional innovation

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Abstract

The domain of education, like many institutions in contemporary society, faces significant challenges to the completion of its mission. This is especially true of higher education, which in many countries faces increasing expectations that it serves as a driver facilitating social and cultural advancement. New modes of inclusive delivery need to be tested with real students, new curriculum approaches need to be validated, new platforms need applications and content to succeed, and analytical tools need broadly based data to be truly useful. These also include new ways of collaborating and presenting domain specific subject matter. It is increasingly likely that the University of the future will not look like present-day institutional arrangements.

Keywords: higher education; institutions; innovation; disruption; gamification; MOOC; blended learning; certification; learning markets

1. Background

Effective institutions are those that proactively explore innovative and effective approaches to restructure the delivery of “content” in conjunction with institutional change and the increased use of external partners. Such approaches include accessible technology solutions, practice and process changes, and focus not only on completion but also on access, both conceptually as well as substantively. Institutional efficiencies supported in part by partnerships and collaborations across systems, the cultivation of relationships with nontraditional educational partners, and cross-disciplinary initiatives are all critical to the sustainability of this approach. Also key is an understanding of the benefits as well as consequences of implementing technological solutions, especially given rapid technology changes. Innovative approaches on the horizon include: massively open online courses (MOOCs), a virtual delivery model that allows participation in learning activities at convenient places and times, rather than forcing students into set timeframes; blended learning, which combines on-line and face-to-face interactions, which

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can facilitate widespread, often global collaboration with other students and teams of specialized instructors; and Gamification which applies game-driven structures and incentives to learning. More process-oriented approaches include enhanced use of experience based and group activities, alternative certification of learning objectives, as well as institutional approaches such as “markets” for learning options.

This paper examines the disruptive forces impacting the delivery and inclusiveness of "University Education" and speculates about the potential structure and impact of high performance learning and virtual collaborations as well as policy opportunities and barriers to successful strategy development.

2. Innovative Change Elements

Change will occur on at least three different fronts in higher education: 1) technologies and approaches within—and beyond—the classroom, 2) practices and processes that enable learners to acquire the necessary skills, and 3) institutional change and innovation that make these disruptions possible. Further, these change elements must demonstrate five characteristics necessary for innovative change:

- Relative advantage over what is currently done,
- Compatibility with existing values and practices,
- Simplicity, ease of use, and accessibility,
- Trialability to determine to level of uncertainty, and
- Observable results [1].

3. Disruptive Innovation

A wide array of actors: faculty, instructors, NGOs/foundations, researchers, governments and industry, are exploring new ways to engage students, both within and beyond the walls of the classroom. Information and Communication Technologies (ICTs) augment the type of interactions possible between teacher and student, between student and material (e-accessibility), as well as among students themselves. Ideally, these disruptive technologies will meet students at their level in an always-connected society, assuming first, fundamental connectivity, and second, that meaningful access is present. The following are examples of innovative approaches to facilitating instruction and learning.

3.1. Technologies and Approaches

3.1.1. Gamification

The application of game mechanics to non-game settings, gamification is a potentially disruptive approach to higher education. Not to be confused with educational games—in which typical classroom lessons are ported to a game format—gamification relies upon game mechanics to provide learners with exploratory space and encourage them to move through the space using feedback mechanisms [2]. This approach has been applied with success to marketing, the workplace, and now education. Successful games typically include three aspects: a goal that is to be met by the learner, obstacles that create challenge and difficulty for the learner, and collaboration or competition, which can include competition against self [3]. These technologies, by virtue of their malleability, and ability to assess and adapt to the characteristics and needs of the users, facilitate design of learning solutions that “tune themselves” to the characteristics of the learner, without necessarily requiring excessive external intervention. Such a self-adjusting approach, removing some of the “assistive” (interventionist) qualities of technologies can be expected to allow learning to occur in a more natural manner.

One large-scale implementation, albeit at the K-12 level, is Quest to Learn (Q2L) [4]. This public school replaces traditional curriculum and pedagogy with games designed to be highly engaging. All subjects are taught using game mechanics, requiring students to defeat “bad guys” as they learn. Students experience increased collective learning and participation, receive more timely feedback than occurs in a standard class, and are supported in an environment

where failing is acceptable—even a good thing [5]. Gamification is designed to simulate, in a fun way, situations and challenges experienced in everyday life while motivating students to succeed.

Gamification is not without its drawbacks and unanswered questions. Goals and progress must be clear to the learner [3]. Although games are designed to be fun, the novelty can quickly wear off when driven too heavily by external motivation, such as earning points and being assigned to a leader board for exceptional performance [6]. Moreover, games are meant to be mysterious; they are wild and perhaps untamable. Churning out gamified classrooms in an algorithmic way might ultimately be counterproductive [7].

3.1.2. Massively Open Online Courses

Implementing aspects of constructivist learning theory, massively open online courses (MOOCs) dispense with the traditional educational approach of a set curriculum in favor of an approach based on connecting specialized nodes of information [8]. Guided by a facilitator, hundreds or even thousands of students interact using social networking technologies such as wikis, blogs, and Twitter. MOOCs distance themselves from typical online distance courses by removing the passwords [9]. Students are encouraged to freely share information with other while developing emergent learning groups.

The educational value of MOOCs is just now being explored. One such example is a course entitled “Connectivism and Connective Knowledge” (CCK08) [10]. The course was offered formally through the University of Manitoba, informally for free to anyone anywhere in the world, and in a hybrid manner (e.g., for credit at another university). Although students were required only to develop a blog and concept maps, numerous other tools were brought to bear on the experience, from learning management software to 3D immersive environments. The experience catered to users’ needs—such as those involving language, time, and ICT skills. Twenty-five “traditional” students quickly turned into 2,300 interconnected learners.

It is not yet clear how best to implement an effective MOOC, but current evidence points to a delicate balance of a variety of factors. Openness offers the possibility for new voices to join the discussion, and although voices can dissent—sometimes for the benefit of those involved—these voices can sometimes be disruptive and unproductive [9]. Optimal facilitation of students resides somewhere between allowing the students to guide their own learning while at the same time creating an atmosphere of open communication [11]. This open space for communication allows learners to build upon existing knowledge, but it can be difficult for some to get started given the potential extreme openness of the experience [12].

3.1.3. Blended Learning

Aimed at leveraging the advantages of each, blended learning combines face-to-face (FTF) interactions with communication enabled by information and communication technologies (ICTs). A key consideration here is that ICTs should be designed to compliment—rather than replace—traditional pedagogy [13]. Further, each of the two components must be integrated to form an orchestrated learning approach [14]. Initial research suggests that students are not only accepting blended learning approaches, but also they are improving their learning outcomes.

Blended learning approaches are currently being tested on topics ranging from microscopic anatomy to foreign policy. Using MyMiCROscope [14], students learned about anatomy using an intelligent virtual microscope, complete with continuously zoomable high-resolution images and annotations. The tool had two primary impacts: it allowed students to work at a self-guided pace suited to their learning needs; and it encourage group work and social interactions. When learning about foreign policy [15], it was found that FTF interactions support lively and engaging discussions, while ICTs elicit reflective thoughts on the topic. Integration between these two elements is key.

Student acceptance is an important variable for determining the success of a blended learning experience, because without student engagement, the necessary discourse and interaction will not be achieved. For students to accept the approach, the system must be easy to use, enable to the teacher to respond in a timely manner, and—perhaps most importantly—be considered applicable and useful to the course itself [16][17]. Integration of ICTs with FTF is a necessary, but not easy, goal to achieve.

3.2. *Disruptive Practices and Processes*

3.2.1. *Experience Based and Group Activities*

The role of professors is changing from classroom lecturer to a variety of other things, such as social network facilitator and an information aggregator. Classrooms will be modeled after how people accomplish goals in the real world by situating learning in the real world. Social networks offer the possibility of changing how learning is consumed. Disappearing are the days of broadcast teaching where a lecturer professes one-size fits all knowledge to a group of passive recipients [8]. The many nodes of a learning network—such as the professor, the students, subject matter and domain experts, as well as the ICT platform, itself—can be connected equally and without hierarchy. Innovative deployment of ICTs (e-accessibility) can additionally open entirely new possibilities for students with disabilities, giving new dimensions to the concept of college access. Knowledge can flow freely among peers and between learners and teachers. By bringing together learners, teachers, and professionals, students can engage in pragmatic problems, learning in the context that the knowledge will be used.

3.2.2. *Alternative Certification*

A new model that rethinks the idea of accomplishment and necessitates continuous improvement will replace the factory model of granting degrees. Currently degrees represent an end-point, a notion that a predefined curriculum has been mastered and that learning has been achieved. In this new model, there will be no end-point, no time at which learning has been completed. Continuous improvement will become the norm as employers look for people who are able to keep up with—and even push forward—ever-evolving technologies in a constantly changing global environment.

One potential mechanism for supporting this new view of certification is badges; or put another way, the Boy Scouts model of mastery meets higher education. For various skills—technical writing, web programming, graphic communications—students and employees alike will be able to take short, mini-courses to gain new skills. These skills can be acquired on-the-fly, only when necessary. Skill specialization can occur, allowing workers to become more productive while avoiding lengthy absenteeism to attend marginally relevant classes.

Badges, while holding the promise to deliver skills in a timely and targeted manner, fly in the face of traditional certification and accreditation. How will this approach be standardized—if it should be standardized at all—so that the badges convey something meaningful? A sea of buzzword-entitled badges might only serve to confuse employers as to the actual skills possessed by students. As courseware is opening up, perhaps certification should follow. We should allow those who receive benefit from certification—in this case, employers who wish to know what skills will be possessed by a new graduate who has received any sort of certification—to define how to certify, or value, badges.

3.2.3. *“Markets” for Learning Options*

Learners in increasing numbers are realizing they have the option to shop around for the educational approach that suits them and their budget. There are a range of options—both old and new—that allows learners to acquire knowledge and skills. Online courses are being offered for free or little charge; and online content generally has the advantages of being electronically accessible to screen readers and similar technologies. Traditional schools are putting some of their content online for free. Complete online degrees are being offered at a cost much lower than students have been paying for on traditional campuses. While the efficacy of these options is currently being explored, they are offering enticing alternatives to traditional learning models.

3.3. *Institutional Innovation and Change*

At the heart of disruption in higher education are the institutions themselves. Having evolved over decades and centuries, many institutions have kept up with an ever-changing world. But considering the rapidly changing landscape that informs the skill-base of workers and professionals today, these institutions must change just as

quickly—if not more quickly—than the needs of the populations they serve. Campuses are going to change. We are likely to see campuses combine to eliminate redundancies and improve efficiency. This will be an effort to focus and refine the notion of a “geographic” campus. Yet there are other approaches that seek to expand and make fuzzy the concept of campus. One such approach is MITx. The Massachusetts Institute of Technology is beginning to offer their content free to the public available anywhere the Internet reaches. No longer is the acquisition of knowledge from MIT limited to the confines of a campus.

In some cases, however, reinventing the institutional experience of colleges and universities has required starting from square-one, at least in terms of the physical aspect of the experience. Courses from giants such as the Massachusetts Institute of Technology and the University of Michigan are being used as the intellectual basis for new, online colleges. Many, charging a nominal fee compared to typical tuition costs, are offering courses to thousands of students, with enrollments growing each year. Knowledge from these revered campuses is now reaching students hundreds or thousands of miles away, students who might never step foot on the sacred ground that is the university campus.

4. Conclusion

Opening up access to content begs some important questions to ensure that the process is equitable. Socioeconomic status has long been a barrier to higher education, but even with new technological mechanisms for sharing knowledge, how and who should pay? No matter where learning occurs, devices such as tablets and smart phones are key, so what accommodations will be made for those without the necessary technology? Cross-cultural collaborations are becoming increasingly easier, but how do various parties interact given language barriers? Those with disabilities and functional limitations can potentially benefit from the proliferation of educational technologies, but how do we design them to support access for all learners? These are just a few of the many questions facing all stakeholders—students, parents, faculty, administrators, policymakers, and more—to truly re-envision intuitions of higher education in the 21st century.

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