Electronic Pedagogy and Future University Business Models

Fred Niederman
Saint Louis University, niederfa@slu.edu

Brian S. Butler
University of Maryland

R. Brent Gallupe
Queens University

Bernard C. Y. Tan
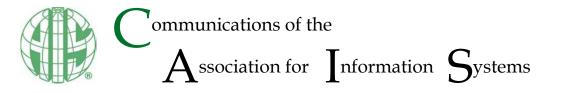*National University of Singapore*

Cathy Urquhart
Manchester Metropolitan University

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Abstract:

Based on the International Conference on Information Systems' (ICIS) 2014 senior scholars' forum, we share insights on the relationship between evolving university business models and the adoption of electronic pedagogy. In recent years, particularly with the initiation of MOOCs, the potential for delivering high-quality and widely distributed coursework has expanded. However, particular instances of MOOCs and other electronic pedagogies do not guarantee equally high-quality educational outcomes for all participants. For example, some studies have suggested that most individuals completing MOOC coursework already have baccalaureate degrees, which contrasts with the idea that individuals undertake such coursework as a substitute for traditional degree programs. With this paper, we present varied experiences and views on using electronic pedagogy and report on both the conclusions and new questions raised about adopting these technologies for universities.

Keywords: Electronic Pedagogy, Online Courses, University Business Models, Technology Adoption.

1   Introduction

The cost of higher education is increasing rapidly and has already exceeded the ability of many middle class Americans to pay without incurring substantial debt or obtaining significant scholarship funds or other financial aid. In the UK, the marketization of higher education has pushed the average cost of an undergraduate degree to approximately £9000. While students are not expected to start repaying their loan until they earn a reasonable salary, this marketization has changed how people select their undergraduate majors. In some sectors in Europe, rising costs threaten the continuation of "free" education for students or, alternatively, requires that the education's quality drop through lack of reinvestment and reinvigoration. In this paper, we examine how this landscape might be affected by massively open online courses (MOOCs) and other computer-mediated mechanisms for delivering pedagogy. Historically, organizations across many industries have used information technology (IT) to make themselves more effective and more efficient, particularly by automating repetitive, computationally-intensive tasks and freeing people to engage in more creative problem-solving tasks. IT can also affect the creation and delivery of content (e.g., industries pertaining to music, films, and books).

The single largest cost component of higher education is faculty salaries. Hence, institutions face significant pressure to leverage faculty time by using information technology to supplement or replace faculty. We stand at the confluence of economic stresses on higher education and the transformative nature of information technology as applied to education. The fundamental question we consider is: how will the massively open online course (MOOC) concept be used and what impact will it have on the pedagogy, the business model and, perhaps, the entire paradigm of higher education?

We can view higher education business models largely in terms of their mixture of income sources. University income derives largely from five sources: tuition from students, funding from government agencies, grants, donations, and, where available, investment income from endowments. An increasing number of generally government-supported universities, such as Queens University in Canada, now conduct programs sustained only through tuition. State-supported and private universities vary in the relative emphasis placed on research grants versus tuition-generating teaching. Such differences affect institutions' ability to gather revenue but may also affect expenses for laboratories, support infrastructure, and labor to fulfill the grant purposes. A growing crop of "for-profit" universities exemplified by the University of Phoenix in the US have little or no direct government funding or grants except as loans to students but have significant revenue from tuition and capital through issuing equity and bonds.

In the light of these forces and trends, serious pressures to lower the cost of higher education exist. Unfortunately, while cost is relatively easy to measure, quality is not. Many of these pressure sources are inclined to view education as a commodity where lower cost means a bargain rather than a simple trade off on a cost-quality continuum. The measure applied of cost per credit hour rarely considers that the value of all credit hours is not necessarily equal. The threshold of knowledge for awarding units, the contextual richness and larger mental map into which knowledge fits, and the ability to create, investigate, and question beyond the packaged content are difficult to assess and reward. In the general atmosphere of "dumbing down" curricula, the problem may be less about contrasting units across programs and more about the meaning of a unit of learning at its most fundamental level.

This paper proceeds as follows. In Section 2, we present further discussion and background material regarding electronic pedagogy and university business models. In Section 3, we present a variety of viewpoints discussing factors that affect whether higher education institutes should adopt MOOCs and other electronic pedagogy at this time. In Section 4, we review some of the discussion presented at the panel, and, in Section 5, we conclude with recommendations and new questions for the IS community.

2   Background of Electronic Pedagogy and University Business Plans

Electronically mediated pedagogy varies in terms of three dimensions: *delivery mechanism, class size,* and *approach to content*. Delivery mechanisms can range from posting some reading or administrative materials online (at a minimum) to complete content delivery through online mediation; major categories include, but are not limited to: face-to-face, teleconferences, static online content, and dynamic online content. Class sizes can range from smaller seminar-sized groups with few students to the thousands enrolled in MOOC programs. We define class size as small, medium, and large, where small is perhaps less than 50 and large greater than 100. We note, though, that many schools routinely implement face-to-face courses of 500 or more using mass lectures (typically delivered by a professor) coupled with smaller

discussion groups (typically facilitated by a teaching assistant). Approach to content can range from "automating" traditional models via centrally distributing static material online to using interactive online activities that provide educational experiences that are either impossible or impractical in face-to-face settings.

Considering these dimensions, countless variations on the specific implementation of electronic pedagogy exist. While it is well beyond our scope here to present a comprehensive taxonomy, these dimensions provide an indication of the complex design space institutions face when developing pedagogy and course delivery strategies.

MOOCs offer several theoretical advantages as a tool for learning. Recording a lecture once, particularly from an outstanding presenter, and having it viewed by a global population of students has potential economic advantages over locally creating and delivering lectures for smaller groups. When content is relatively stable and pedagogical strategies are well understood, this method presents the prospect of significant cost savings. Incorporating social media and discussion capabilities allows questions to be addressed in a MOOC forum and answered by other students with assistance from a teaching assistant (TA). This arrangement potentially allows students to have the benefit of viewing lectures from gifted faculty members and assistance from peers at reduced cost and greater convenience.

On the other hand, using MOOCs is not without risks and costs. Such costs include running and supporting the platform, verifying and screening applicants, making sure participants have correctly completed the requirements, updating content (particularly for IS topics that are subject to continual change), supporting students' queries and problems, and general administrative costs. Universities also risk cannibalizing their own students from other programs (and, thus, incurring additional costs but without new revenue) and creating brand confusion if their online presence degrades their traditional image (rather than their traditional image elevating their online presence). More generally, whether students do in fact receive the same value from MOOC programs and traditional programs remains a matter of significant debate.

Some established faculty members object to such programs because they see them as a substitute that reduces the need for traditional educators and creates downward pressure on academic pay (where else would savings come but through lowering personnel costs?), but then we in IS should be sensitive to similar complaints in many industries where automation replaced workers and/or shifted jobs to new information-enhanced ones. San Jose State University proposed using a MOOC created by a Harvard Philosophy Professor Michael Sandel as the primary lecture for its philosophy course in social justice with its own faculty members serving as discussion leaders. The faculty members did not receive the proposal well: they viewed it as a mechanism of reducing head-count. The philosophy faculty also articulated several pedagogical concerns in an open letter to Professor Sandel (http://s3.documentcloud.org/documents/695245/san-jose-state-u-open-letter.pdf).

There is a growing body of evaluative research pertaining to the various approaches to electronically delivering content. For example, some recent studies have found that a small percentage (but still large absolute number) of MOOC participants actually finish. They have also found that those who do finish likely already have undergraduate degrees, which suggests that these programs may be more effective for offering continuing education than foundational education experience. It is also not clear that these programs would exist at all without significant direct funding from players such as the Gates Foundation and indirect subsidies from universities that make the cost (nearly) zero for participants but creates an unstable long-term model for their institutionalization. Proponents counter that much remains unknown about how to best use these tools. Early experiments with the "flipped" classroom (typically, where students watch lectures at home and work together on problem sets in class) show that, under ideal conditions, such a situation can increase learning, particularly for those not successful in traditional programs.

3 Panelist Views on Electronic Pedagogy and University Business Models

3.1 Framing the Issues: Cathy Urquhart, Manchester Metropolitan University

Online pedagogy is a question that's been bothering most IS academics for many, many years. There have always been questions about the educational efficacy of online teaching, and we can see MOOCs as

perhaps the latest in a long line of disruptive technologies. There are perhaps two key differences with this latest disruption.

The first is that, with an open course, one obtains potentially much wider impact. MOOC content can benefit everyone, including people in developing countries who may not have access to such material in their own countries.

For example, Stanford University had more than 300,000 students enrolled in three computer courses (Hyman, 2012, in Billsberry, 2013). That's very exciting. Several big universities are making huge investments in MOOCs, and Billsberry (2013) suggests that one reason is that this provides a nice "shop window" for universities.

The second difference that is clearly happening with MOOCs and has perhaps not been seen before is a de-coupling of learning from assessment or content from assessment. It is clear that universities still provide a stamp of approval, but the evolution of online learning challenges what such learning comprises and how we validate that it has occurred. Universities do provide status and reputation: anyone can provide material and teach that material, but accrediting the learning is something else. I'm involved in a mixed-mode DBA with a University in Beijing, and what they're interested in is being able to accredit that content. Billsberry (2013) points out that the accreditation of MOOC learning amplifies the problems that universities already have with impersonation and plagiarism. One solution is to set up examination centers, yet another is to use fingerprinting technology that proves that someone has typed a particular answer (Eisenberg, 2013, in Billsberry, 2013). However, we also know that, in many institutions, "lifelong learners" rather than students mostly use MOOCs. One will find that the biggest market for MOOCs are people who are employed professionals. They'll just do a MOOC in their spare time and it might be about philosophy or it might be a case just updating a skill set. That's what they're doing and, often, people won't actually get a certificate—they won't actually bother to get the accreditation. Current estimates put the number of students starting programs who actually achieve certification at 5 to 11 percent (Peterson, 2014).

A deeper question that we can ask about MOOCs and all forms of online courses is: what value do we add when we are lecturing? We don't see ourselves as instructors. We see ourselves as educators. So what are we adding? I think we're adding experience, we're adding tacit knowledge, and we're adding knowledge of the research discipline. When we reach a point of discussion that is truly interesting, we can push further and challenge students to think through into new territory. I can only offer an anecdote at this moment that encapsulates it for me. I'm standing in a master's class with about ten students and we're talking about the slides that are on the projector. I'm saying to them, you know I put these slides up on the VLE (Virtual Learning Environment), I put them up on Moodle for you, but really you know that's not what we come to class for, is it? And they said, no. They said that then worst thing that ever happens to them is if they go to a class and you've got an instructor who is just reading their slides. I know that they come to me and come into my class because they want to know about my professional experiences; they want to know about the research that I know about around these particular points that I'm presenting.

That is not to say that long-distance presentations cannot be effective. I've had people rush up to me at this conference and say, "I saw you on YouTube". I try not to panic while hoping they got something out of it—that feeling of being in the classroom. So I think it is an interesting question of whether or not recording content in visual media such as YouTube and online seminars can capture some of the exploration into new ideas. It also raises the question of whether it can add something valuable: perhaps the option for viewers to proceed at their own pace, time their participation to their readiness, and repeat difficult or unclear portions.

So it is clear that the introduction of these technologies with their direct and indirect impact on students is changing the necessary instructor skill set. I hear teachers saying that their job isn't really to educate anymore but that it's crowd control, it's to entertain, and it's to be charismatic. Billsberry (2013) makes a similar point: given the cost of production of MOOCs—editing, directing, and so on and the actual content—perhaps institutions will value only "big name" professors. Perhaps students' changing attention span and interests is transforming both classroom and cyber-learning cultures. Finally, the issue of what value we add to the learning process is closely linked to issues of assessment and accreditation.

3.2   MOOCs and Flipped Classes: Bernard Tan, National University of Singapore

At the National University of Singapore, the journey on MOOCs and flipped classes commenced more than 2 years ago. Top universities' efforts (such as Stanford, MIT, and Harvard) to roll out electronic

platforms (such as Coursera and EdX) to facilitate MOOCs and flipped classes have been intriguing. In a short period of time, many other universities from different parts of the world came on board these platforms to offer MOOCs, which seems to be a trend that we have to take seriously.

To better understand the circumstances under which MOOCs and flipped classes may be able to contribute effectively to tertiary education, senior members of the university management signed up as students in Coursera for a variety of MOOCs. The learning experience has been enriching. Some MOOCs are significantly more effective than others. The least effective MOOCs tend to be the ones in which instructors simply do the MOOCs the way they did their face-to-face classes. For example, they would take each lecture, chop this into pieces, and craft each piece as a video in MOOCs. The most effective MOOCs are the ones in which instructors completely re-conceptualize the course. They identify key learning artifacts (e.g., concepts that students ought to know after taking the course). They build a video (sometimes involving multimedia and animation) for each key learning artifact. They then build additional videos to illustrate the relationships among concepts and when and how these concepts may be applied. Over and above these, they create assessment tasks that serve to reinforce learning by allowing students to applying these concepts in a variety of contexts. Basically, they are creating assessments for learning (rather than assessments of learning that we are so familiar with).

In spite of the fact that MOOCs can be effectively constructed for some subjects, there may still be limitations in terms of opportunities for student interaction. Interacting on the discussion forum is not quite the same as interacting face-to-face. Hence, to provide opportunities for student interaction, the university chose to do flipped classes rather than MOOCs. There are more than 20 flipped classes across various disciplines at the National University of Singapore. If flipped classes are well designed and shown to facilitate effective learning by students, they can become pervasive.

We need to think about how MOOCs and flipped classes may potentially disrupt the traditional model for tertiary education. The present trend is pointing to a re-configuration of the classroom. We have always been bringing students into the classroom. But, increasingly, MOOCs and flipped classes are bringing (at least, a significant part of) the classroom out to students. In the near future, there may a re-configuration of the course. We used to have instructors crafting the entire set of course materials. With MOOCs and flipped classes, it may be possible to provide students with the learning objective with an outline and give students freedom (with some guidance) to go out into the world to search for materials and then share these materials with the class. For example, in many introductory courses, good materials are widely available on the Internet, so it is not really necessary for instructors to re-invent the wheel. Further into the future, there may be a re-configuration of the degree. If students want to acquire a body of knowledge on information systems, they need not necessarily have to come to the National University of Singapore to enroll in the degree program. Instead, they can "craft a degree" from widely available templates on the Internet. Then they decide how and from which university they would like to acquire the relevant knowledge via MOOCs over the next few years. They can take a few MOOCs from each university. If they are able to finally acquire a coherent body of knowledge and demonstrate competence on information systems, why should they not be hired for jobs? Information systems departments that have given adequate thought about how technologies may shape the future should be in a position to advise university management on the possible consequences of such disruption to the model of tertiary education.

MOOCs and flipped classes are of interest to university management. Many information systems departments are, in fact, in a position to carry out research that can yield valuable insights on these topics. The methodology for such research would be those that the information systems community is already familiar with. We need to pursue such research more deliberately to demonstrate the value of our research findings to university management. It should not be difficult to find funding support for such research efforts.

3.3   An Academic Administrator's View: Brent Gallupe, Queen's University

I have been the Associate Dean (Faculty) or was the Associate Dean (Faculty) at the Queen's Business School for about 10 years. My responsibilities were to develop and translate strategy into faculty action. I'm going to provide an academic administrator's view of how MOOCs are perceived by people charged with investigating and possibly implementing MOOCs at their universities. Queen's has had a long history of distance education. It has been running online courses for many years, and it has delivered online/video conferencing MBA programs for over 20 years including one in partnership with Cornell

University. With this institutional experience, one would think MOOCs would be a logical extension of course delivery at my School.

Academic administrators feel a lot of pressure. They get pressures from all kinds of sources. There are pressures to reduce costs. By reducing the teaching cost per student, academic administrators save money at the school and the university levels. There are pressures to generate revenue. They've got to figure out a way to generate more revenue for their school because this revenue will help pay for other things the school would like to do. There are pressures to improve the quality of everything the school does. Any new initiative must be of high quality and must enhance the school's reputation. There are pressures to increase the variety and diversity of what the school does by offering innovative programs to a wider pool of students. There are pressures to develop sustainable courses and programs, and to think of the longer term rather than the short term.

So all these pressures (reducing costs, generating money, improving quality, enhancing reputation, increasing variety and diversity, and being sustainable) provide an interesting background for engaging various university stakeholders, including faculty, administrators, alumni, and students, in exploring a MOOC initiative. In my discussions with faculty about the kinds of things that might be able to be done with MOOCs at the school, I encountered resistance. Real resistance! I wouldn't say all were resistant, but a significant majority were. They were actively resistant, which means some voiced their objections through the faculty union, some protested on media that any MOOC initiative was something that is not good for education, and some tried to develop a kind of collaborative resistance to using MOOCs by contacting other universities in Canada. Some other faculty engaged in passive resistance. This means that they felt that if they did nothing and just ignored it, then it would go away. Alternatively, they would express support for a MOOC initiative but would argue that someone else should do it.

Interestingly, most of the administrators were resistant as well. Most administrators and other people in similar positions at my university argued that there is no way this would work, we can't do this, this takes too many resources, this is going to take a massive amount of time, and this is not going to give us the wins we are expecting. They felt they were being forced into doing this.

With the alumni, there was a dichotomy of opinion. Some alumni said, yes, this is going to extend the reach of our school around the world. The school's reputation will be enhanced by being associated with schools involved with MOOCs such as Stanford and Harvard. On the other hand, some alumni said, no, don't mess with the school's brand. Doing this could damage its reputation. Don't even consider this because it could affect donations and the kinds of things that alumni could do for the school.

Finally and most interestingly, most of the current students did not want a MOOC initiative to happen. They did not want MOOCs They did not want the school to be associated with MOOCs. They wanted their on-campus experiences to be the defining way that they think about their school. With all this resistance to a MOOC initiative from an administrator's point-of-view, what is the future of MOOCs?

Maryam Alavi and I wrote a book chapter (Alavi & Gallupe, 2000) that we called the "Transformation of Business Education". In this chapter, we basically argue that we see two evolving models of business education: the campus-based model and what we called the transformation model. It is turning out that the transformation model is a lot like the development of MOOCs with the broad reach of technology taking schools beyond the campus-based model. I believe that, like every other technology that we've experienced, MOOCs will morph. They will evolve into something that meets the needs of the people and institutions that will use them. As someone said to me, "We are going through the classic Gartner Hype Cycle" and "We're at the peak of inflated expectations, the trough of disillusionment is coming, and maybe the slope of enlightenment will finally arrive". I believe MOOCs will evolve, and I think we are already seeing this. I read about acronyms such as DOCCs (distributed online collaborative courses) in which, instead of one instructor, a course has many instructors that are collaborating with many students in an online, distributed, "many-to-many" learning situation. Another acronym that I like is MOOSEs. MOOSEs are massively open online student experiences. MOOSEs are not courses. They are brief learning/social experiences distributed online; little things that people can pick up and can collaborate with online. The last acronym is the one that I like the best because I believe it most closely describes how most MOOCs will evolve. SMOOCHs are smaller massively online open course hybrids. The idea is that the size of these initiatives in terms of students is going to change into something that fits what schools are doing online and that they will develop hybrid combinations of online technology and possibly face-to-face to provide the most effective learning experiences for their students.

For academic administrators, MOOCs and their variations will offer both opportunities and challenges. One thing that can be said with some certainty about these initiatives is that the future will be an exciting one.

3.4   Recognizing Our Strengths: Brian Butler, University of Maryland

IS research and educators should be involved in MOOCs because we are experts in working with half-baked ideas. As Bernard argues in Section 3.2, one of the things that IS departments and IS scholars need to do much, much more of is make themselves indispensable to the top decision makers in their institutions. They are grappling with what we have studied for years. We have concepts and ways of thinking about technology-enabled change that they don't know. A physicist or engineer or whoever who's become the university president in many cases is only now having to think about the things that we teach our students. A reality of life in academic institutions is that, if decision makers personally value the knowledge we're providing, then arguments about its value on a larger scale are more convincing and easier to make.

In the context of MOOCs, we need to remember that, in information systems, we're experts at imagining things that don't exist. That's what we do. We teach our students to look at situations, imagine things that don't exist, work out how to make them happen, and think about what might happen that's unexpected (unexpected outcomes from things that don't yet exist—second-order imagination). These are some of our most important core competencies, ones that we sometimes overlook because, as empirical researchers, we often focus on things that already exist.

We also know how information works. Most of the anxiety, fear, and hopes about MOOCs and online education more generally are based on fundamental misunderstandings of the nature of information, the nature of information markets, the nature of information institutions, the nature of information technology-enabled change, the nature of communication, and the nature of learning. People that don't understand those complex phenomena very well and make assertions and predications, and it terrifies people or creates great hope that is not realized.

The knowledge we have as IS scholars and educators is critical for helping our institutions, colleagues, and students identify misleading assumptions, evaluate the constant predictions of doom and utopia, and negotiate the challenging but exciting times we face. I highlight some examples that point at some of the misunderstandings but also point toward the strengths of universities, academic units, and IS as a discipline. One example pertains to the naïve, simplistic models of information and knowledge implicit in many claims about MOOCS. One of the arguments we hear about MOOCs or online education is that we will have the best lecturer in the world create a MOOC, whoever or wherever they happen to be (though they always seem to be from Stanford, Harvard, or MIT for some reason). They'll create a MOOC class and then we don't need all the different classes and instructors. To see the misunderstanding in this claim it is helpful to consider drama and theater. We have Lawrence Olivier's Hamlet (and other world-class performances) recorded, so why do we need another Hamlet? Why do we keep producing Hamlet or King Lear? Why do we waste our time? And why in the world do high schools and colleges produce plays when they could just go to YouTube and watch a really good version? Why waste their time and money on these activities? In these questions about drama, we see can more clearly see the limitations of simplistic approach to education based on a fundamental misunderstanding of the nature of information.

Information is an experience; it is a performance; it is an object; it is all of these things and we know this. Sometimes a repeated performance makes sense and provides value. Other times, it's a waste of time. Does it have economic implications? Yes. Television and recorded music decimated traveling musicians. The number of musicians needed is lower. Does that mean we don't have novel, new performances? That there is no value to local performance? No, it still happens.

Second, it is useful to think about the following: what's a question? When somebody asks a question, what are they doing? It can be a prompt for intellectual activity, which may or may not be social. Asking a question can be a public admission that you don't know something, which can be a risky, terrifying thing to do. A question is public speaking unless you're asking only one person, and even then it's a form of public speaking. A question is a request for information. A question can be the start of a debate or other kinds of interaction. A question can be a test. I want to know if you know. Now I don't really want to know the answer; I know the answer—I want to know if you know it. And as all academics know, a question could be an opening for stating a position and not a question at all. A question can be something simple or a complex, risky social activity.

When we create courses whether online or offline, we create environments where students can engage in and experience the full complex of these types of seemingly simple activities. We create experiences and we create social environments, and that's a hard thing to do. We don't necessarily always succeed at it. We do it ok sometimes and not others. The question isn't whether we use MOOCs or not; the question is what kind of experience or social environment do we want to create and what are the right tools for doing that. As IS scholars, we know that getting enamored with a tool is unwise. We know that one should focus on the requirements, emergent or otherwise. That's where one gets the value. When one purchases tools or invests in tools without appropriately considering specific needs and requirements, too often the ultimate results will not be the best possible ones for the institution or society.

A third misunderstand that creates confusion around MOOCs and online education relates to the technology-enabled unbundling. A common narrative is that technology results in inevitable unbundling. We used to have albums and radio stations—producer dictated collections of songs—and now we have (or can have) unbundled digital music. One can buy any song they what and can recombine the songs any way they want. So too will education go with courses and programs devolving to libraries of pieces, which assumes two things: first, that the elements are independent. I have a science fiction magazine I was reading. I was going to bring it and tear it into four pieces and say, "Isn't it great, I've unbundled it". Not so much. There's value to the bundle (or at least well-designed components). The second thing we always have to remember is creating bundles is complicated. Creating bundles requires expertise. It is not trivial to create high-value bundles. It is wonderful to imagine that students will be able to assemble learning experiences for themselves from available materials online, and some students won't be able to do that. However, most instructors that have taught for decades can't create the optimal the first time they run a class. It's an experiment. They have to do it two or three times to get that bundle right. Are individual student really going to be able and willing to do this work to create the bundles of content, materials, and experiences they need?

We are primarily experts in creating bundles. We are not primarily experts in creating content. Universities have for hundreds of years created bundles. One's research is a bundle. If one has no citations in their paper, it won't get published. In fact, there are studies that suggest that, for the most highly cited papers, about 80 percent of what's in them is drawn from the existing literature and only 20-30 percent is new. We are experts at bundling and re-bundling. A course is a bundle. One takes a textbook, content, their own experiences, and the students' experience. It can be a dynamic bundle in a lecture; it can be a more static bundle. We are experts in re-bundling and constructing bundles. What's a degree? It's a bundle; it is a hierarchical bundle. I would argue that one of the things that universities can't lose sight of is that a critical core competence is the ability to create high-impact bundles that meet immediate local needs in their communities, among their individual students, among whatever their stakeholders are. That's their competitive advantage. And it's when we get enamored with the protecting of any one bundle that we have marketing myopia. When an administrator is focused on running a degree, that's a problem. When they recognize that they have the ability to create degrees to meet needs, one can adapt. "I know how to run this course" is a weak position; "I can create courses of this type as needed" is a dynamic capability that is likely to be robust. Unbundling shouldn't scare us. Unbundling just gives us more to work with. Unbundling gives us more opportunities and more interesting design space as long as we remember that our competitive advantage is re-bundling.

A final aspect of information and learning that is often misunderstood in MOOCs relates to mass production and mass customization. Much of the excitement around MOOCs in terms of cost is based on assumptions about potential economies of scale and standardization—a central premise of a mass production logic. However, I argue above that universities are actually ideally suited for mass customization. We do mass customization. Different students combine different courses; they have different experiences whether they choose to interact with the instructor or not, and a degree is a very flexible structure, relatively, that provides strong value. However, one can choose not to do the degree that way but another way.

Yet, some politicians and administrator wish that universities operated more like effective mass production units. Why would anyone take an institution that, for centuries, has been focused on mass customization and try to make it work like an early 20th century manufacturing operation when most contemporary organizations are struggling to figure out how to do knowledge-intensive mass customization? That's essentially saying that we should go backward and shift from a position of societal leadership to that of an institutional laggard.

The bottom line is this: if one's institution is far along that transition—if one's school, department, or university has already given up on creative bundle construction and mass customization and focused on mass production and economies of scale as its core business model—one should be scared. That is no more a viable business model for higher education in the 21st century than it is for manufacturing physical goods. If on the other hand one's university, college, or department has maintained a focus on re-bundling and mass customization at a variety of levels, then one has a very solid foundation to work with, and all MOOCs do is add another tool to your toolbox. The question then is "when is it the right tool?".

Ultimately, it's not a question about MOOC vs. campus; it's a question about does this allow us to provide new, high-impact bundles that meet the needs of our stakeholders. If the answer to that is yes, then we need to build the capability whether faculty resists or not. It's worth the financial and institutional investment. If it's not, then we shouldn't burn ourselves out by chasing the next newest thing (another lesson that we routinely teach our IS students at all levels). On campus or off campus, online or offline, in ICT or in computer media communication—these end up being simplistic distinctions that fade over time. Online vs offline relationships, online vs. offline communication—there's something there, but it's actually a distraction most of the time. The question really needs to be what's the underlying factor, the underlying model, or the underlying process that one is talking about and how does the relatively minor change that is attracting attention now but will fade once people have learned how to use it play into that? For higher-education, that underlying process is mass customization and re-bundling—things that MOOCs and online education create far more opportunity for than they threaten. And that's something IS scholars have studied and taught.

4 Students and Employers as Additional Stakeholders

Conversation between the panel and session participants focused largely on two other perspectives. Discussion emphasized students' and employers' perspectives. Because the panel focused on university business models, the discussion focused on providers of education, both institutions and individual faculty members. However, it is clear that these constituents are not alone as key stakeholders for the topic. Students' and employers' views and actions relative to digital pedagogy are also critical.

4.1 Student as Stakeholder

Another way of looking at student expectations is conveying a range of levels of engagement. Students will vary in the degree to which they want to participate in co-creating knowledge, in which they are willing to engage in discussion (in a traditional model) or create their own "bundling" of educational components. Students have different ratios of commitment to learning as distinct from acquiring a degree. Perhaps this has been evolving independently or perhaps it is partly in response to the changes in technology-delivered content both educational and recreational.

In a sense, we may be wrestling with issues of conveying our beliefs and values such as intellectual curiosity (which may or may not be conveyed through technology-mediated learning) when some students may not be interested in or willing to absorb them. There may also be an information overload problem. Students now have access to information through Wikipedia, Google search, digital libraries, and the like that was unheard of a generation ago. Are they using such sources? Would we know if students are self-educating but in ways that don't show up on traditional testing?

Another variation among students pertains to their wealth and class. In some traditional settings, children in low-funded schools watch videos "so teachers don't have to teach" (session participant). We have to consider the potential for technology to provide a low-cost substitute for more thorough education. Putting remedial courses on line may be "useless" when students don't have a learning environment as a context. Of course, for some people who cannot afford university education (in some countries where tuition is high), access to online education may provide a conduit for learning not otherwise available, even if only rarely used by exceptional students.

Much discussion revolved around the potential for MOOCs to create a "flipped classroom". As a specific example of one style of "bundling", routine or rote learning can be shifted to independent work and more deliberative, reflective, or participatory work can be a focus for more human interaction and quicker feedback.

4.2   Employer as Stakeholder

How do employers look at this value proposition of universities? One session participant made the following comment:

> *When I was doing my graduate work at a small school down the Charles River called the Harvard Business School, I was talking to a recruiter from a Wall Street firm and asked what was the value proposition for him recruiting from the Harvard Business School. He said it's very clear, there is nothing they learn at the Harvard Business School that is any value to our company, but a lot of very bright people apply. We love their screening mechanism. We like that this is face-to-face. We'd lock them into the gymnasium for two years and let them develop the contacts, the rolodex, the connections, unlock the door. We would hire them just the same because we figure they have a stamp of approval and in fact that's what we're looking for. That's one view, and I'm not sure how MOOCs fits in that model.*

The point is well taken that traditional education has multiple facets only one of which is the transfer of information and knowledge. On the one hand, unbundling these facets—transfer of knowledge, maturation and screening, networking, acculturation—may lead to relatively low-cost economic opportunities for those willing to pay for and receive a subset rather than the full set of assets. On the other hand, such economic opportunities unbundled may come up short across the full range of criteria whether or not they provide information and knowledge at equal or higher levels. While parents and students may be the primary stakeholders in decisions for "consuming" education; employers will make selection decisions in hiring and career paths that influence the ultimate value of prior educational investments. It will be interesting to see how quickly, if at all, employers shift to viewing completely online education programs (and hybrids) as equivalent or better certifications for employment candidates. Early online education adopters (e.g., students), to the extent they are motivated by increasing job-seeking competitiveness, will be anticipating future effects on the value of their investment. Lower costs in the present may ultimately shrink future competitiveness; alternatively, early entry may provide membership in a desirable small cadre of innovative risk takers. As employer responses to early graduates are observed and reported, their cumulative reaction is likely to guide future educational "purchasing" decisions.

5   Conclusion

There is a unique role for universities to bundle knowledge packages. This is a skill that not all individuals have—to gather and integrate components such that synergy is created from their selection, sequencing, and accomplishment. However, business models that target charging a premium for such bundling are not yet mature. Pressures on university administrators tend toward moving to mass production (rather than customization) and toward lowering costs but at the risk of losing revenue to universities that provide higher value at similar or proportional cost.

To the degree that education is a multibillion dollar business, where will revenue accumulate and who will pay the price? How much will students pay for the experience of custom bundling of education and to whom will it be paid: infrastructure providers, content providers, or those integrating components into a smooth experience? Will businesses and governments provide financial support to next generation infrastructures, pedagogical techniques, and tested programs? Will those investing early establish unshakable competitive positions or will they be overtaken by those standing back from the bleeding edge to invest in second or third generation artifacts that have shaken out early misconceptions in blending technology features with pedagogical needs? Regardless of the actual outcomes of digital learning tools, the perception of their effectiveness or inevitability can have an impact on foundations' and governments' willingness to invest in different sorts of educational proposals.

In the short run, universities must account for the perceptions of online educational tools as reputation builders or "eroders". Issues of evaluation and accreditation also persist. When the nature of education and learning changes, legacy methods of testing and assessment may no longer suffice to capture either changes in the "knowledge state" or of "value-generating capability" of individuals or individuals as embedded in relevant groups. We can expect pedagogical issues in terms of the ability to transfer knowledge in innovative ways (or the inability of computer-mediated techniques to do so) to play a key role in the future of higher education. The ability for designers of computer-mediated learning's educational content to incorporate pedagogical approaches to present material along with new technology may be the crucial element prompting more widespread adoption.

MOOCs play a role as one of many types of components that universities can select and integrate. At present, infrastructures may not yet have been built that facilitate transitioning from shifting traditional educational materials into a new environment to using the full array of digital capabilities to engineer new learning structures. Such bundles may include face-to-face interactions in traditional or innovative settings, a wide variety of accessing discrete knowledge through searching the Internet, and pre-packaged digitized lecture and other course material. It remains to be seen how the expansion of unbundled components will affect the skill sets and nature of instruction, students' ability to learn and demonstrate learning, the means for universities to disseminate and create knowledge, and whether any of this will appeal to employers or create employees capable of creating value in private and public sectors.

In the panel discussion, we heard two divergent cases. In the former, an assertive but selective approach is being applied to the expanded use of online tools. In the latter, an array of stakeholders expressed significant resistance toward moving to online education. It is clear in the first case that the ability to rethink about the new affordances offered by technology support is critical to the level of quality of particular courses. Integrating pedagogical knowledge of how students learn with content material and the potential of new technology to deliver such materials in creative but also effective ways is vital to acceptance of online education as fully equivalent to traditional methods. In the latter case, much resistance to the approach of online education may represent a realistic view of the current state of its ability to deliver at the highest quality level (in reasonable price ranges) or it may, in the long run, represent an initial reaction to a "disruptive technology" in the sense that Christensen (2003) uses to indicate a technology that begins with a lower-end market, generates enough revenue for reinvestment in its own improvement, and, eventually, emerges as a replacement, or at least a challenge, for even the highest end customers.

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About the Authors

Fred Niederman serves as the Shaughnessy Endowed Professor of MIS at Saint Louis University. He obtained an MBA and a Ph.D. in Management Information Systems from the University of Minnesota. He is a proponent of grounded theory and theory building as a way to enrich the MIS discipline and build intellectual content customized specifically to our discipline of practice. He has published more than one hundred articles in leading research journals and refereed conference proceedings. He serves on editorial boards for the *Project Management Journal*, *TMIS, JAIS, CAIS, Human Resource Management, Journal of International Management*, *IEEE Transactions on Engineering Management* and the *Journal of Global Information Management.*

Brian S. Butler is a Professor in the College of Information Studies at the University of Maryland; Director of the Master of Information Management Program; and Director of the Center for Advanced Study of Communities and Information (CASCI). His research, which has appeared in *Information Systems Research*, *MIS Quarterly*, *Organization Science*, *Journal of Biomedical Informatics*, and the *Journal of Medical Internet Research,* combines theories and methods from organizational theory, information systems, and information studies to better understand how emerging technologies affect teams, communities, and organizations. Current projects include studies of policy formation and application in Wikipedia, technology use in local food systems, the design of online communities for large-scale education initiatives, and models and metrics for systems of online groups.

R. Brent Gallupe is a Professor of Information Systems; Director of the Queen's Executive Decision Center; and former Associate Dean (Faculty) at Queen's School of Business, Queen's University at Kingston, Canada. He also holds an on-going Visiting Professor appointment at the University of Auckland, New Zealand. His current research interests include IT and organizational transparency, collaboration technologies, and learning in a digital world. He has held editorial appointments at a number of leading IS journals including *MIS Quarterly*. His work has been published in such journals as *Management Science, MIS Quarterly, Information Systems Research, Academy of Management Journal, Sloan Management Review,* and *Journal of Applied Psychology.*

Bernard C.Y. Tan is Vice Provost at the National University of Singapore (NUS), where he was formerly Head of the Department of Information Systems. He is Shaw Professor of Information Systems at NUS, where he has won university awards for research and for teaching. He was the 15th President of the *Association for Information Systems*. He is a Fellow of the *Association for Information Systems*. He has served on the editorial boards of *MIS Quarterly* (Senior Editor), *Journal of the AIS* (Senior Editor), *IEEE Transactions on Engineering Management* (Department Editor), *Management Science* (Associate Editor), *ACM Transactions on Management Information Systems* (Associate Editor), and *Journal of Management Information Systems* (Editorial Board Member). His research has been published in many IS journals including *ACM Transactions on Management Information Systems*, *Communications of the ACM*, *Decision Support Systems*, *European Journal of Information Systems*, *IEEE Transactions on Engineering Management*, *Information and Management*, *Information Systems Frontiers*, *Information Systems Research*, *Journal of Global Information Management*, *Journal of Management Information Systems*, *Journal of the AIS*, *Management Science* and *MIS Quarterly*. His current research interests are social media, virtual communities, and Internet commerce.

Cathy Urquhart is Head of Research at Manchester Metropolitan University and Professor of Digital and Sustainable Enterprise at the Manchester Metropolitan University Business School. She is a past Senior Editor for *MIS Quarterly,* and an Associate Editor for *Information Technology and Development,* as well as an Editorial Board member for *Information Systems Journal.* She has published in many journals such as the *Journal of Information Technology, the European Journal of Information Systems*, *Information Systems Journal* and others. She is past Vice President for Special Interest Groups and Member Services of the Association for Information Systems (AIS), which is the premier organization for IS academics. Dr. Urquhart is a member of the AIS Special Interest Groups for Global Development (SIGGLOBDEV), Grounded Theory Method (SIGGTM) and of the IFIP 9.4 Working Group on the Social Implications of Computers in Developing Countries and IFIP 8.2 Working Group on Information Systems and Organizations. She is a member of the ICIS Women's Committee. She is author of *Grounded Theory for Qualitative Research: A Practical Guide,* published by Sage in 2013.