What Do Current College Students Think about MOOCs?

Andrew W. Cole, Ph.D
Communication Instructor
Department of Communication Skills/Social Science
Waukesha County Technical College
800 Main Street; Pewaukee, WI 53072, USA
acole13@wctc.edu

C. Erik Timmerman, Ph.D
Associate Professor
Department of Communication
University of Wisconsin-Milwaukee
PO Box 413; Milwaukee, WI 53211, USA
eriktimm@uwm.edu

Abstract

Faculty, administrators, and media outlets express a range of opinions about Massive Open Online Courses (MOOCs). As any adoption of MOOCs should ultimately be done to benefit students, this study examines current college students' understandings of MOOCs. Thematic analysis on qualitative data reveal a pattern of student perceptions that MOOCs can contribute to lifelong learning but are inferior to traditional "for credit" college courses. Student attitudes toward MOOCs revolve around 6 primary themes: reliability, accessibility, content, learning, communication, and outcomes. As the themes identified in the current data mirror previously published MOOC commentaries in many ways, pedagogical discussion of MOOCs should move beyond polarized evaluations and incorporate student perspectives in further empirical investigation of MOOCs as a learning environment.

Keywords: MOOCs, undergraduate students, automated instruction, online learning, learning environments

Introduction

Over the last several years, Massive Open Online Courses (MOOCs) have received significant coverage in the higher education literature (e.g., Bates, 2014; de Waard, 2011; Pence, 2012). Advocates suggest that MOOCs will make high quality education more accessible and decrease the substantial costs of higher education (Carey, 2012; de Waard, 2011; Lewin, 2012). Conversely, some critics take issues with academic rigor in MOOCs, and fear MOOCs will serve only to generate profit for exclusive universities and private corporations, ultimately at the expense of faculty and students (Byerly 2012; Marshall, 2014; Rivard, 2013). Despite ongoing discussions over using MOOCs in higher education, debates and critiques of MOOC seldom pay attention to current college students' perceptions and attitudes toward MOOCs. It is heretofore unclear how familiar college students are with the MOOC concept and how they view MOOCs as a source of learning.

This study examines current college student's perceptions and attitudes concerning MOOCs. Historically situating MOOCs as the latest form of "automated instruction" allows for connections to be drawn between previous technological innovations' impacts on pedagogical practice. Then, the research questions guiding the analysis and the methods utilized in the study are described. Using qualitative analysis, students' responses to eight open ended questions about MOOCs are synthesized into six

thematic categories. The conclusion describes ways that the findings from this study can contribute to current discussions on the place of MOOCs in higher education

The Promise of Automated Instruction

The MOOC essentially represents a more personalized form of "automated instruction," a process by which content is provided to students using a preprogrammed automated system rather than through a live instructor (Cook, 1964). Like other forms of automated instruction, MOOCs represent a "self-instructional device" through which students learn, complete course material, and receive feedback at their own pace (Cook, 1964; Silverman 1964). Prior to the advent of web-based delivery platforms, Finn (1964) suggested that an instructional device itself is not as important as the content offered to students through the device. In other words, for students to benefit, those utilizing automated instructional methods must properly incorporate theories of teaching and learning into the execution and design of the self-instructional device. Therefore, attention should focus on the way the technology is experienced by student users, rather than the potential benefits of the technology itself.

Many education researchers thought automating the delivery of basic course concepts and materials could potentially free up instructors' time so that they could provide more direct support to students (Silverman, 1964). Additionally, some researchers predicted students would learn, and maintain, course material more effectively from automated instruction due to instantaneous feedback and the self-paced style (Fry, 1964; Silverman, 1964). Silverman, in particular, noted that automated instruction creates a more efficient "person-to-subject matter relationship" than traditional instruction (p. 29). However, the perceived benefits of a greater "person-to-subject matter relationship" also raised fears of the end of traditional education, primarily through the notion that automation would eventually reduce the need for face-to-face instruction.

Concurrent with the move toward automated instruction, many educational administrators and stakeholders placed a premium on the use of educational television and film in the classroom. One of the primary perceived benefits of educational films initially was that all students could, in essence, be taught by standout instructors and researchers from prestigious institutions across the world through recorded presentations that could be replayed anytime and anywhere (Rosenberg, 2001). However, educational television ultimately had little impact on the instructional landscape (Rosenberg, 2001). A potential explanation for the lack of revolutionary change produced by educational television and film could lie in what the film cannot do, adapt to individual student needs and learning styles (Fry, 1964), Despite the early promise of educational television and film, these technologies failed to revolutionize teaching and learning to the extent that many advocates predicted (March, 1987; Rosenberg, 2001).

A line of discourse similar to the promise of educational television and film emerged in the 1980s centering around the increased number of computers on US college campuses (Cuban, 2001) and the turn toward "Computer Assisted Instruction" (CAI; see Kulik, 1984 or Timmerman & Kruepke, 2006). When discussing the adoption of computers in universities during the 1980s, March (1987) suggested "much of the adoption of a new technology depends on the symbolism it evokes" (p. 16). Much like previous instances of automated instruction, computers were predicted to radically change the way teaching and learning took place.

Following widespread adoption of computers across college campuses, online learning or "E-learning," became an essential component of higher education in the late 20th century and early 21st century. "Attending" courses through the Internet became the most recent method of distance learning, a course format initially more equated with correspondence study (Pittman, 2013; Rosenberg, 2001). Meta-analyses addressing the effectiveness of distance learning (Allen, Mabry, Mattrey, Bourhis, Titsworth, & Burrell, 2004) and student satisfaction (Allen, Omori, Burrell, Mabry, & Timmerman, 2013) suggest online course delivery has some slight advantages over more traditional instructional formats. However, despite students' flexibility in "attending" online classes and engaging the course content, traditionally online courses represent a course delivery format rather than a true self-instructional device. Within the dynamic context and ambiguous nature of e-learning, MOOCs, the newest form of (potentially) automated instruction has arisen.

The Move to MOOCs

There are two prominent MOOC models, c-MOOCs and x-MOOCs. In the first model, students drive the content and structure of the course, facilitating the learning process along the way. Student driven MOOCs are often referred to as connectivist MOOCs or c-MOOCs (Bell, 2011; Cabiria, 2012; Rodriguez, 2012). C-MOOCs are based in the principles of connectivism (autonomy, diversity, openness and interactivity) (Bell, 2011; Cabiria, 2012; Pence, 2012). As c-MOOCs focus on peer learning, they are often not structured like traditional lecture courses or, even, more traditional online courses where the instructor primarily drives the course content and structure. The c-MOOC format can be seen in "Peer2Peer University," a website offering a wide variety of MOOCs focused on peer learning and facilitated by lay experts (Ahn, Weng, & Butler, 2013). In these types of MOOCs, one individual, or a group of individuals, may organize the course but the actual instruction of the course derives from the discussions and contributions of participants themselves rather than a specific, featured instructor (Ahn, Weng, & Butler, 2013; Rodriguez, 2012).). Previous research suggests c-MOOC students are primarily adult, lifelong learners not particularly concerned with finishing the course (Rodriguez, 2012). For this reason, c-MOOCs may develop a large following of interested participants, but participants may not feel as invested in the course as in courses organized in the top-down, instructor lecture based style (Ahn, Weng, & Butler, 2013).

Instructors drive the content and structure in the second primary MOOC model. Instructor driven MOOCs, or "x-MOOCs" (Bates, 2014), more closely resemble large lecture courses than c-MOOCs as the instructor provides course content in a detailed, prescribed format, following a previously established curriculum (Cuban, 2001; Pence, 2012). In 2008, Stanford offered such an x-MOOC focusing on artificial intelligence. Of the over 160,000 students enrolled in the Stanford AI MOOC, approximately 20,000 completed the coursework (Bremer, 2012). After completing the Stanford artificial intelligence MOOC, non-Stanford students were sent a letter with their course grade and class rank (Bremer, 2012). More recently, websites like Coursera have become popular sources of instructor-driven MOOCs.

Currently, little research has sought to systematically examine student perceived advantages or limitations associated with MOOC formats. Much learning-centered research into MOOC students analyzes student posts in the actual MOOC course shell (Liyanagunawardena, Adams, & Williams, 2013). Such an approach only provides insight into actively engaged MOOC students and fails to account for "lurkers," those students who engage the course content but do not interact. Although empirical results are limited, prescriptive treatments of the topic suggest that, MOOCs appeal most to very organized and self-motivated students (Bremer, 2012). Additional research highlights engagement, and community-building, in MOOC users through the encouragement of free sharing between participants and use of a wide range of participatory media including wikis, blogs and social media sites (Bujak, Baker, & DeMillo, 2012; Liyanagunawardena et al., 2013). Instructors in top-down structured MOOCs, however, often find a lack of collaboration and participation in the course to be problematic (Ardis & Henderson, 2012; Hew & Cheung, 2014). It is not yet clear whether students share the same concerns as instructors, but previous studies establish that MOOCs have relatively high dropout rates, often with completion rates as low as 10% (Hew & Cheung, 2014; Kizilcec, Piech, & Schneider, 2013; Pence, 2012). This study intends to add to the extant literature by analyzing current college student perceptions of the MOOC concept.

Rationale and Research Questions

Articles in The Chronicle of Higher Education and eLearning Magazine, as well as in news outlets like USA Today provide commentary on potential benefits and costs of MOOCs. Within such articles, the needs and perspectives of the greater public (often reflecting the promise of liberating education for the masses) are highlighted (Byerly, 2012; Carey, 2012; de Waard, 2011; Lewin, 2012) as are the perspectives of faculty and administration (Chamberlin & Parish, 2011; Duneier, 2012; Marklein, 2012; Parry, 2010). Though such articles offer much discussion over MOOCs' placement in higher education, attention seldom turns to actual users (or potential users) of MOOCs. Despite the fact that college students presumably would be greatly affected by widespread adoption of MOOCs in higher education, very little attention is paid to current college students' perceptions and attitudes towards MOOCs.

Empirical research has not yet determined the degree to which MOOCs can provide learning experiences that are similar to that of a regular college courses or if students learn as well using this course format (Bujak, Baker, & DeMillo, 2012; Fisher, 2014; Hew & Cheung, 2014). Much research into MOOC learners focuses on experiences within MOOC courses (Liyanagunawardena et al., 2013). However, students

currently enrolled in MOOCs constitute a population of early adopters of a new technology. For MOOCs to be widely accepted as effective means of education, MOOCs must achieve a critical mass of users to either align with or overcome prevalent existing student attitudes toward higher education (Markus, 1990). At a minimum, efforts to market MOOCs must address the variety of concerns that potential users may raise about the instructional format. To this end, the current study attempts to extend the MOOC literature by examining answers to a first research question:

> RQ1: *What are the common perceptions among current college students about the nature of MOOCs?*

It is necessary to gain an understanding of the average undergraduate student's level of familiarity with the MOOC concept. Additionally, as outlined above, popular press often documents MOOC discussions in which current college student perceptions and attitudes are absent. Therefore the second research question guiding this study is:

> *RQ2: How do current college students' perceptions and attitudes toward MOOCs compare with press discussions on MOOCs?*

Methods

Because the goal of the current investigation was to generate an understanding of general perceptions about MOOCs (rather than articulate empirical claims about their value), data were collected from a sample of college students, the primary audience ultimately targeted by many current developers of MOOC offerings. These participants consisted of 84 undergraduates recruited from a variety of introductory undergraduate courses at a large, urban, Midwestern university. Participants ranged in age from 18 to 44, with the majority (*N* = 73) falling between the traditional college ages of 18 to 24. In line with current demographic trends (Lopez & Gonzalez-Barrera, 2014), more women than men participated in the study, with women making up 62% of participants (*N* = 51). As many highly publicized MOOCs originate in prestigious private universities, data on whether participants had attended private or public school prior to attending the current university was collected. 81% of participants attended public school (*N* = 68), with 17% (*N* = 14) having attended a combination of public and private school, and only 2% (*N* = 2) having exclusively attended private school. Thus, the data represented a fairly typical cross-section of traditional college students with varied degrees of familiarity with the concept of a MOOC.

Procedures

Following IRB approval, the researchers advertised the study in several undergraduate courses. Instructors in some courses offered a nominal amount of extra credit to students who participated in the study. Students who expressed interest in participating were able to click a link in a solicitation email, which took them to a web-based survey containing open-ended questions about students' perceptions of MOOCs. Following completion of the questionnaire, students were given the opportunity to provide their name so that the researchers could provide participant lists to instructors to attribute any allotted extra credit points for participation.

Questionnaire and Study Objectives

For the current study, the researchers developed eight open-ended questions (Appendix A) to gain insight into how current college students enrolled in a traditional undergraduate degree program perceive MOOCs. It was assumed that not all students would be familiar with the MOOC concept, so the first question asked participants if they were familiar with MOOCs. If a participant was unfamiliar with MOOCs, he or she was provided with a brief explanation of a MOOC highlighting characteristics such as the limitless class sizes and open access. Unfamiliar participants were then directed to an example c-MOOC before receiving the open-ended questions. Those familiar with the MOOC concept were provided the open-ended questions without the c-MOOC example.

Because the goal of the study was to generate perceptions about the nature of MOOCs in general, the task did not seek to provide students with a comprehensive overview of all MOOCs, features of MOOCs, and so on. Instead, the goal was to present the basic concept and then solicit reactions in order to classify general opinions about the instructional format. The intention was not to identify which perceptions were most predominant, accurate, or well-articulated; rather, to understand the general

nature of these opinions and the concerns that were raised, as well as to classify these responses into categories for further assessment.

Results

Eighty-four responses to all eight questions were examined using thematic analysis (Guest, MacQueen, & Namey, 2012). This exploratory method of analysis is useful for illuminating the categories into which students' beliefs about MOOCs may fall. To this end, each of the 84 participants were assigned a respondent number for the researchers to keep track of their responses and later draw associations among participant characteristics and responses.

Thematic coding of the data was completed in two steps. First, general themes found in the data across all eight questions were labeled. From this process, 18 themes were identified (Table 1). Six thematic categories were then established based on conceptual similarity observed in the responses categorized into each theme. The final six categories established for analysis were "Issues concerning reliability" (N = 64), "Issues concerning accessibility" (N = 49), "Issues concerning content" (N = 44), "Issues concerning learning" (N = 41), "Issues concerning communication" (N = 34), and "Issues concerning outcomes" (N = 18). The categories and examples of responses demonstrating each category are provided in Table 2. Responses were not necessarily exclusive to particular categories. For example, a participant's response to Question 3 may have included issues concerning content and issues concerning reliability. Examples of the different categories and examples of responses are detailed below. Minor typographical and grammatical errors in participant responses were edited to improve readability.

Table 1.

Themes Identified through Initial Coding

• Reliable	• Unreliable
• Relationship to College	• Ease of Use
• Cost	• Student Contingent
• Not Scholarly	• Instructor Contingent
• Personalized	• Helpful
• Student Learning	• Only Basic Information
• Interaction	• Lack of Credit
• Diversity	• Convenience
• Size	• Support

Table 2.

Thematic category groupings, percentages and examples

Themes	%	Representative Examples
Reliability	81	• They provide decent base information but I would question the reliability of the information. • I think that they are a very unreliable source of information.
Accessibility	58	• I think they are a good source of information especially for people who do not have extra money for extra classes or even those who do not have money for college in the first place. • I like that it's open to whomever, and can be convenient for those with tricky schedules.
Content	52	• What I dislike is the opportunity to create false information. • If there are no grades involved, then there is definitely some freedom there – like reading a book when you are not going to be tested on it versus when you are.
Learning	49	• I do think it is a new learning style and many people would find this helpful. • I like that it is an opportunity for anyone to learn a concept. I think that lifelong learning is something that should be done, not just to get more degrees.
Communication	40	• You are not familiar with your classmates and cannot help each other or discuss lessons. • If you don't learn by just listening, there is no interaction to help you.
Outcomes	21	• I dislike the fact that they don't offer academic college credit. • The 'degree' doesn't seem to really get the student anywhere down the road.

Thematic Categories

Reliability

The thematic category most prevalent in the data dealt with the range of issues that students raised about the reliability of MOOCs as a form of instruction. Such issues were addressed by 81% of participants. This category consists of responses in which participants suggest that the information contained in MOOCs is reliable, but only to a certain extent:

> While much of the information is correct, I wouldn't use it much past basic facts and dates. I believe they will get the information correct on a man or woman's date of birth, where they were raised etc but all the analysis is strictly a random person's perspective on history that is not necessarily peer reviewed by an academic on the issue (Q1, #11).

The issue of reliability is particularly salient to participants discussing the c-MOOC format in particular:

> If the only information provided is considered to be peer-oriented, I'm not sure how accurate the information would be. Not to side with teachers and/or educators on this, but anyone can post or improve someone else's writing - that doesn't mean that it will always be completely accurate (Q1, #29).

Students did not always view the peer format as inherently negative, even when questioning reliability in a c-MOOC:

> I would have a concern about legitimacy. It seems that there is little to no regulation and just about anyone could teach it. But at the same time that seems to be the great thing about it. A regular person can share their passions with others. The best and worst thing to me about these classes is that anyone can do it, much like Wikipedia (Q8, #7).

The tension between the positive and negative qualities of MOOCs is particularly salient in c-MOOC responses as the openness of c-MOOC styles courses allows for anybody to facilitate the course. For students, the ability for anybody to facilitate a c-MOOC can be, and is sometimes described as a positive trait of MOOCs. Overall, students appear to believe it necessary to accept that MOOCs may provide less reliable information than a traditional college course.

Accessibility

Whereas students' concerns about MOOC reliability tend to focus on both positive and negative aspects, the second most dominant category, accessibility, tends to focus more on the open nature of MOOCs as a positive feature. Often the positive perception of this MOOC characteristic reflects potential benefits of online education in general:

> It can be good because it can save people's time to go to classes. Instead they can just stay in their room to conduct everything (Q1, #62).

Other times, MOOCs are praised for the potential to bring higher education to those who could not otherwise access it:

> I like that it's open to the web and that people who would normally not get to learn about things because they cannot attend a college for some reason can further advance themselves, which can help them in their jobs and careers (Q3, #36).

Often students view access positively in terms of monetary cost, as highlighted in the following response:

> I like the idea that such concepts are making education and knowledge more accessible than ever before. People who do not, for example, have enough money to attend a college or university can now progress their education. (Q3, #71).

Overall, many students view MOOCs positively because they make education and knowledge more accessible to more people. The open nature of MOOCs is seen by many students as bringing the advantages of higher education to a population that previously may have been unable to access higher education.

Content

A third category centered upon the MOOC content. Often balanced against a concern about reliability, content issues dealt with the overall nature of the material being delivered in MOOCs. For instance, one respondent noted that efforts to further explore MOOC content provides a learning experience in itself:

> A learning experience is offered because you can't trust everything that is on these sites. You must cross reference the information and use it pretty much only as a base or starting point when doing research. Or really anything that would require you to use these for that matter (Q2, #30).

The tension between reliability and content is further exemplified in the following response:

> The thing that I like and dislike about MOOCs is the same thing, essentially. I like the fact that everyone who has even a little bit of information about a topic can share that information with others. You don't have to be an expert in the field to put your two cents in somewhere. However, that is also a downfall, because when someone is looking for a reliable source of information for a class, these sites won't be useful. People are so obsessed with them though that they try to rationalize using them anyways (Q3, #23).

Responses such as these suggest one MOOC benefit is that anybody with valuable information can share that information with others. However, unlike in a traditional college course, that material is viewed as potentially unreliable, so the course itself can be viewed as potentially unreliable as well.

Learning

The next category of responses reveals students' perceptions about MOOCs capacity to facilitate learning. For instance, one student expressed that even though MOOCs may be reliable sources of content, they are not necessarily suitable sources of teaching and learning:

> I think they are a good source of information but not a comparable source of teaching. I think they get a lesser thing accomplished--short term results and short term learning (Q1, #65).

Other students felt MOOCs could potentially be used as a worthwhile learning tool for some students, depending on their specific goals:

> One characteristic of a MOOC that interests me is the fact that it is open, and there are endless possibilities and opportunities for me to find a course or article that is perfect for my needs (Q5, #43).

The instructional quality of the MOOC course is one of the most common concerns in the learning category of responses:

> I would expect the instructor to be pretty overwhelmed with e-mails and questions from a much larger group of students. I think this would also take away from the instructor's ability to keep the class on course. They would also need to be able to work with a more diverse group of students and understanding of their potential special needs (Q6, #69).

Some respondents note that a match between course and learning styles are paramount if learning is to occur with a MOOC:

> I think they are about equal. It depends on the student's learning capability. Some people can learn fast and well on their own while they would struggle in the classes. Others achieve more in class than vague communication (Q7, #45).

Some responses further note that some students benefit from more guidance than could be expected in a MOOC:

> They might do well, depending on the student and their learning style. For me personally, I would rather have the personal relationship with the professor and my classmates; it enhances my learning (Q7, #54).

Therefore, students appear to believe that students with particular learning styles and educational preferences may benefit from MOOCs but such benefits are not universal.

Communication

Many respondents reported that interaction with instructors and peers is paramount to the educational experience. These respondents indicated concern over whether the MOOC format has the capacity to allow effective communication between participants. Some responses characterize the MOOC format as an obstacle to communication:

> I think MOOCs provide just a general and basic learning experience because I feel that to learn effectively you need interaction and the opportunity to ask questions (Q2, #19).

Conversely, other student responses indicate an expectation that since MOOC content in self-sustaining and pre-made, MOOC instructors should offer greater opportunity to interact with students:

> [I would expect the instructor] not to perform pre-rehearsed lectures but instead be available to actually help students one-on-one, and to monitor areas where the class as a whole could use improvement and altering the course to match those needs (Q6, #27).

Responses like the one above appear somewhat out of place given the enrollment size of a MOOC. Although opportunities for one-to-one interaction with instructors may be fairly uncommon in many MOOCs, or occur infrequently and only at ascribed times, responses indicate that current college students consider the potential impact the MOOC instructional format would have upon interactions with instructors and other students.

Outcomes

Course credit is one of the most common issues respondents represented in the final category concerning outcomes. Though numerous responses establish course credit as a major criterion that, if met, would establish the legitimacy of MOOCs, some responses do focus on the positive nature of lifelong learning, even without credit:

> I would expect it to provide more of a life experience than an actual academic experience. You cannot earn a degree or credit, so it wouldn't help you attain a degree (Q2, #7).

Often responses that highlight the positive nature of lifelong learning also speak towards how the experience of being a student in a MOOC can add to the MOOC student's skillset:

> A MOOC should always provide a learning experience because it allows students to learn accessing different websites, programs, and software allowing them to have that new experience and be able to apply it to their daily lives, such in future jobs and careers (Q2, #75).

Sometimes these skills are thought to be personal gains, in addition to professional gains:

> "I believe one should gain organization and a sense of self-reliance from completing a MOOC course (Q4, #57).

Others feel a positive aspect of MOOCs is how MOOC students aid each other:

> They [MOOC students] should gain additional knowledge on their current topic as well as the satisfaction from helping others by their peer reviewing (Q4, #29).

> They lack much of the substance and dedication that a for-credit course would offer (Q7, #11).

Even though many respondents do view the lack of college credit as a negative aspect of MOOCs, responses like those above demonstrate how many respondents still found a variety of different positive outcomes one could receive by taking part in a MOOC. Though currently very few MOOCs provide students with grades they can use toward college credit, more and more MOOCs offer verified certificates of achievement (see Coursera, 2014). Concerns over the rigor and quality of MOOC course offerings will likely increase as use of MOOCs in higher education increases.

Discussion

Often when student perspectives are incorporated into MOOC discussions and research, the perspectives offered are those of MOOC students, in the form of course discussions and feedback, rather than current college students. The current study gathered current college students' responses to a series of questions about perceptions of MOOCs. Thematic analysis of the data yielded six primary categories of student concern: reliability, accessibility, content, learning, communication, and outcomes. The next section of this report further interprets these findings and proposes a series of extensions for future research.

Analysis of student responses points to three primary conclusions. First, college students are not passive content consumers who are insensitive to delivery method (whether MOOCs, face-to-face, or otherwise). With specific regard to MOOCs, many students feel the information available through MOOCs, in particular c-MOOCs, is not of the same quality as the information they receive in a formally structured, traditional college course. Whereas broad treatments of the implication of MOOCs for education may consider features, benefits, myths, and paradoxes of the format (e.g, Daniel, 2012), students also focus upon complex issues ranging from accreditation to ease of access. Often belief that MOOCs are not the same quality as traditional college courses is accompanied by a concern over the lack of college credit. Additionally, many students feel the means of interaction available through MOOCs are limited in depth and breadth to the interaction available as an enrolled student in a traditional face-to-face or online course at a university. Though current students may not all be familiar with MOOCs, they have a range of informed perceptions concerning instructional formats.

Second, accreditation was a common concern crossing over a range of thematic categories. Students often commented on the benefits of MOOCs to lifelong learning but, since higher education traditionally reflects a credit hour standard, students see the lack of course credit in MOOCs as a hallmark of lesser quality. Somewhat surprising in light of the potential benefits of automated instruction, very few students viewed MOOCs as a learning tool that could assist them in the college courses they are currently taking. Instead, students appear to view MOOCs as a different type of course that would require extra time and energy investment, similar to a traditional course, rather than as a tool to assist them in their current coursework.

Finally, the findings from this analysis may provide some insight into the previously documented low completion rates in MOOCs. For reasons not directly clear, many students in this study felt feedback from MOOC instructors should be more prompt than from instructors in their current college courses. Though students in c-MOOCs and x-MOOCs alike might receive prompt and helpful feedback from peers, it is unlikely students enrolled in an x-MOOC like those often offered at Stanford would ever receive direct feedback or answers to their questions from the course instructor. Likewise, the idea that MOOC instructors would be "on call" and have several assistants to respond to student inquiries appears unlikely and quite counterintuitive to a course structure intended to operate indefinitely with potentially little active involvement from an instructor. However, if new MOOC students enter a MOOC with expectations similar to many of the students in this study, they would quickly learn that the course is not what they expected. Such realizations and resultant drop outs may contribute to the low completion rates currently observed in MOOCs.

Limitations and Future Research

As with any research effort, this study does have limitations that should be considered when interpreting the results. First, the set of participants is appropriate for generating initial classification of opinions about MOOCs. However, it is possible the students in these courses at this single institution may either possess more sophisticated perceptions of MOOCs or could have a more limited understanding as a result of limited experience. There may be a range of additional concerns generated by conducting similar data collection across additional institutions.

Second, the method used to collect these responses was an online survey. Using a web-based questionnaire may bias the findings toward students who have a level of comfort and understanding with technology. It is possible, for example, that among participants who have a strong preference for traditional media (e.g., face-to-face), there could be additional concerns about MOOC functionality that are not well-developed in the current set of data.

Although future efforts should certainly seek to address the above concerns, a first direction for future study should build from the categories identified from this investigation. In many ways, the set of concerns identified by students here reflect a range of criteria against which the quality of MOOCs may be assessed using standard instruments. For instance, concerns about reliability may vary widely across different MOOCs. By developing, refining, and maintaining a standard set of evaluative measures, it may be possible to determine why some MOOCs fare better than others. Further, the categories reflected here represent some of the primary obstacles that may prevent the distribution or adoption of MOOCs. It should be noted that the themes identified in the current study are not inconsistent with previous findings concerning students who drop out of MOOCs (Hew & Cheung, 2014). Although the purpose of this study is not to advocate either for or against the MOOC as an instructional tool, efforts to address the concerns identified here could increase the effectiveness of efforts to market MOOC offerings.

Second, as noted in the opening segments of this report, much has been made about the potential drawbacks and benefits of MOOCs. Given the developed body of literature serving to inform MOOC developers, the time has come to formally establish the circumstances in which this instructional format may or may not be effective. Clearly, MOOCs have advantages that are perceived as strengths by students (e.g., wider access, high levels of instructor expertise). Equally as clear are concerns identifying limitations, ranging from issues of reliability of information to the limited interaction between instructors and peers. The evidence reported here suggests that students recognize that a one-size-fits-all MOOC configuration is not the future of education. Rather, efforts should further extend to determine the conditions in which MOOCs are more or less effective.

Conclusion

Findings from this study suggest that perhaps researchers and the popular press should pay less attention to whether or not MOOCs are “good” or “bad” for higher education but rather ask more in depth questions about who MOOCs should serve, and how they should serve. Answers to such questions could better inform decisions concerning the incorporation of MOOCs in higher education. As technological advances are ultimately predicated on the “buying in” of users to reach a critical mass (Markus, 1990), more research is needed on whether or not there is enough “buy in” from current college students to make discussions about the ultimate impact of MOOCs on higher education purposeful. Therefore, this study serves not to add to current debates surrounding MOOCs inside and outside of higher education but rather to attempt to gain a better understanding of the issues embedded within the debates. Of particular concern to all researchers and faculty interested in MOOCs should be how these, at times contradicting issues, are perceived by those whose education would ultimately be affected by greater incorporation of MOOCs into higher education.

References

Ahn, J., Weng, C., & Butler, B. S. (2013). The dynamics of open, peer-to-peer learning: What factors influence participation in the P2P University? In R. H. Sprague, Jr. (Ed.), Proceedings of the 46th Annual Hawaii International Conference on System Sciences (pp. 3098-3107). Los Alamitos, CA: IEEE Computer Society. doi:10.1109/HICSS.2013.515

Allen, M., Omori, K., Burrell, N., Mabry, E., & Timmerman, C.E. (2013). Satisfaction with distance education. In M.G. Moore (Ed.), Handbook of distance education (3rd ed., pp. 143-154). Mahwah, NJ: Lawrence Erlbaum.

Allen, M., Mabry, E., Mattrey, M., Bourhis, J., Titsworth, S., & Burrell, N. (2004). Evaluating the effectiveness of distance learning: A comparison using meta-analysis. Journal of Communication, 54, 402-420. doi: 10.1111/j.1460-2466.2004.tb02636.x

Ardis, M. A., & Henderson, P. B. (2012). Is software engineering ready for MOOCs? ACM SIGSOFT Software Engineering Notes, 37(5), 14.

Bates, T. (2014). MOOCs: Getting to know you better. *Distance Education, 35,* 145-148. doi: 10.1080/01587919.2014.926803

Bell, F. (2011). Connectivism: Its place in theory-informed research and innovation in technology-enabled learning. International Review of Research in Open and Distance Learning, 12(3), 98-118.

Bujak, K. R., Baker, P. M. A., & DeMillo, R. A. (2012, February). The evolving university: Disruptive change and institutional innovation. C21U Paper #22012. Retrieved from http://c21u.gatech.edu/sites/default/files/u21/C21U_22012_Evolving_University.pdf

Bremer, C. (2012). New format for online courses: The open course future of learning. Tagungsband zur eLearning Baltics eLBa. Retrieved from http://www.e-learning-baltics.de/science_program

Byerly, A. (2012, October 29). Formerly known as students. *Inside Higher Ed.* Retrieved from http://www.insidehighered.com/views/2012/10/29/essay-how-moocs-raise-questions-about-definition-student

Cabiria, J. (2012). Connectivist learning environments: Massive open online courses. Retrieved from http://elrond.informatik.tu-freiberg.de/papers/WorldComp2012/EEE6065.pdf

Carey, K. (2012, September 7). Into the future with MOOCs. Chronicle of Higher Education, 59(2), 29.

Chamberlin, T., & Parish, T. (2011, August). MOOCs: Massive open online courses or massive and often obtuse courses. eLearning Magazine. Retrieved from http://elearnmag.acm.org/archive.cfm?aid=2016017

Cook, D. L. (1964). Teaching machine terms: A glossary. In J. P. DeCecco (Ed.), Educational technology: Readings in programmed instruction (1-9). New York: Holt, Rinehart and Winston.

Coursera. (2014). Earn a verified certificate with signature track: Verified credentials to prove your achievements. Retrieved from https://www.coursera.org/signature/

Cuban, L. (2001). Oversold and underused: Computers in the classroom. Cambridge, MA: Harvard University Press.

Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. Journal of Interactive Media in Education. Retrieved from: http://www-jime.open.ac.uk/jime/article/viewArticle/2012-18/html

de Waard, I. (2011, July 25). Explore a new learning frontier – MOOCs. Learning Solutions Magazine. Retrieved from http://www.learningsolutionsmag.com/articles/721/explore-a-new-learning-frontier-moocs.

Duneier, M. (2012, September 7). Teaching to the world from central New Jersey. Chronicle of Higher Education, 59(2), 24.

Finn, J. D. (1964). Teaching machines: Auto-instructional devices for the teacher. In J.P. DeCecco (Ed.), Educational technology: Readings in programmed instruction (13-21). New York: Holt, Rinehart and Winston.

Fisher, G. (2014). Beyond hype and underestimation: Identifying research challenges for the future of MOOCs. *Distance Education, 35,* 149-158. doi: 10.1080/01587919.2014.920752

Fry, E. B. (1964). Teaching machines: The coming automation. In J.P. DeCecco (Ed.), Educational technology: Readings in programmed instruction (21-27). New York: Holt, Rinehart and Winston.

Guest, G., MacQueen, K.M., & Namey, E.E. (2012). Applied thematic analysis. Thousand Oaks, California: Sage

Hew, K. F., & Cheung, W. S. (2014). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. *Educational Research Review, 12,* 45-58. doi: 10.1016/j.edurev.2014.05.001

Kizilcec, R. F., Piech, C., & Schneider, E. (2013). Deconstructing disengagement: Analyzing learner subpopulations in Massive Open Online Courses. Third International Conference on Learning Analytics and Knowledge. Leuven, Belgium.

Kulik, J. A. (1994). Meta-analytic studies of findings on computer-based instruction. In E. L. Baker & H. F. J. O'Neil (Eds.), Technology assessment in education and training (pp. 9-33). Hillsdale, NJ: Lawrence Erlbaum.

Lewin, T. (2012, July 22). One course, 150,000 students. New York Times, p. 33.

Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013). MOOCs: A systematic study of the published literature 2008-2012. *The International Review of Research in Open and Distance Learning, 14*(3), 202-227.

Lopez, M. H., & Gonzalez-Barrera, A. (2014, March 6). Women's college enrollment gains leave men behind. *Fact-Tank: News in the Numbers - Pew Research Center.* Retrieved from http://www.pewresearch.org/fact-tank/2014/03/06/womens-college-enrollment-gains-leave-men-behind/

March, J. G. (1987). Old colleges, new technology. In S. Kiesler & L. Sproull (Eds.), Computing and change on campus (16-27). Cambridge: Cambridge University Press.

Markus, M. L. (1990). Toward a "critical mass" theory of interactive media. In J. Fulk, & C. Steinfield (Eds.), Organizations and communication technology (194-218). Newbury Park, CA: SAGE Publications, Inc.

Marshall, S. (2014). Exploring the ethical implications of MOOCs. *Distance Education, 35,* 250-262. doi: 10.1080/01587919.2014.917706

Parry, M. (2010, September 3). Online, bigger classes may be better classes. Chronicle of Higher Education, 57(2), 1-22.

Pence, H. E. (2012). When will college truly leave the building: If MOOCs are the answer, what is the question? Journal of Educational Technology Systems, 41, 25-33. doi: http://dx.doi.org/10.2190/ET.41.1.c

Pittman, V. V. (2013). University correspondence study: A revised historiographic perspective. In M. G. Moore (Ed.), Handbook of distance education (21-37). New York: Routledge.

Rivard, R. (2013, July 17). No-bid MOOCs. *Inside Higher Ed.* Retrieved from http://www.insidehighered.com/news/2013/07/17/moocs-spread-quickly-aided-no-bid-deals-public-universities

Rodriguez, C. O. (2012). MOOCs and the AI-Stanford like course: Two successful and distinct course formats for massive open online courses. European Journal of Open, Distance and E-Learning. Retrieved from http://www.eurodl.org/materials/contrib/2012/Rodriguez.pdf

Rosenberg, M. J. (2001). E-learning: Strategies for delivering knowledge in the digital age. New York: McGraw-Hill.

Silverman, R. E. (1964). Auto-instructional devices: Some theoretical and practical considerations. In J.P. DeCecco (Ed.), Educational technology: Readings in programmed instruction (27-35). New York: Holt, Rinehart and Winston.

Timmerman, C. E., & Kruepke, K. A. (2006). Computer-assisted instruction, media richness, and college student performance. Communication Education, 55, 73-104.

Appendix A: Open-Ended Questions

Q1: Based upon what you know about MOOCs, how good do you think they are as a source of information?

Q2: To what degree would you expect a MOOC to provide a learning experience? Why?

Q3: What do you like about the MOOC concept? What do you dislike?

Q4: What do you think those who complete a MOOC should gain from the experience?

Q5: What would be some of the characteristics of a MOOC that would interest you?

Q6: What would you expect from an instructor/facilitator of a MOOC?

Q7: How well do you think MOOCs compare to formally taught, for-credit courses at an accredited institution?

Q8: What are some concerns that you might have about MOOCs?