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UNIVERSITY OF CALIFORNIA  
RIVERSIDE

An Exploratory Analysis of Motivation and Engagement in  
Massive Online Open Courses (MOOCs)

A Thesis submitted in partial satisfaction  
of the requirements for the degree of

Master of Arts

in

Education

by

Ian Lee Morris

December 2014

Thesis Committee:

Dr. John Wills, Chairperson

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The Thesis of Ian Lee Morris is approved:

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Committee Chairperson

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## ABSTRACT OF THE THESIS

An Exploratory Analysis of Elements of Motivation and Engagement in Massive Online Open Courses (MOOCs)

by

Ian Lee Morris

Master of Arts, Graduate Program in Education  
University of California, Riverside, December 2014  
Dr. John Wills, Chairperson

Massive Open Online Courses (MOOCs) are a hotbed of debate in today's discussions of online education. Having rapidly expanded and developed since their 2008 introduction, these courses have been called a "transformative revolution" in education with both advocates and detractors alike speaking of their potential far reaching impacts. Despite their recognition however, research into the nascent field remains relatively limited with even fewer efforts having been made to examine the motivational components that impact students' behaviors within this unique educational context. Seeking to explore this gap in research, this study examines student motivation and engagement behaviors in MOOCs through a combination of a literature review and a series of semi-structured interviews with past and present MOOC participants. This study takes a two tier approach to data analysis. The first tier looks at the general experiences and perceptions of MOOC participants. This examines similarities and differences between this study's participants'

experiences and those of other research findings in the field. The primary findings from this level of analysis suggest the importance of program utility value, the potential benefit of the creation of an additional subcategory of MOOC (pMOOC) and the need for continued research into the supplemental uses of MOOC. The second tier of analysis explores the ways in which this study's findings relate to the predominate theories in the field of Motivational Studies. Using Self-Determination Theory (SDT), Socio-Cognitive Theory (SCT), and Expectancy Value Theory (EVT) as theoretical frameworks, this study explores how participant experiences map onto motivational models. Findings at this level of analysis indicate that, while participants frequently addressed many factors tied to all three motivational theories, EVT demonstrated the most salient pattern in relation achievement and engagement behaviors within this study. In closing, this paper examines its own shortcomings and provides suggestions for future research.

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***AN EXPLORATORY ANALYSIS OF ELEMENTS OF MOTIVATION AND  
ENGAGEMENT IN MASSIVE ONLINE OPEN COURSES (MOOCs)***

**1. Introduction**

In recent decades the field of online education has drawn increasing attention from students and institutions alike. With the ever increasing development of online and computer technologies, paired with shifts in pedagogical practices and heavy market pressures, many have come to believe education is in the midst of a “transformative revolution” (Bonvillian & Singer, 2013; Cusumano, 2013; Yuan & Powel, 2013). Several have argued that “disruptive innovations” have challenged traditional educational formats and markets (Bonvillian & Singer, 2013). This has forced many to reassess the viability and potential role of online education and to question the longstanding barriers of distance learning. While the last decade has seen a drastic increase in both the acceptance and use of online learning formats (Allen & Seaman, 2013), the field remains a relatively nascent area of study. Further exacerbating research efforts is the rate at which online learning has changed. Technology and practices often evolve faster than the surrounding research and many have claimed that the study of online learning suffers from a lack specification (Todhunter, 2013; Baggaley, 2013). Overgeneralization have complicated research efforts and fueled polarization in debates. In reality, online learning environments are distinctive and diverse ranging from traditional instructor lead online courses, to hybrid classes, to software-navigated programs devoid of student-teacher

interaction. While these various forms share the general categorization of online learning, their implications for students and classroom dynamics are a far cry from being the same thing. One particularly controversial subset of online learning that has received a great deal of attention in recent years is Massive Online Open Courses (MOOCs). Although less than 10% of universities operated or intended to implement MOOCs as of 2013, most institutions are currently in debate about what role this unique educational model is to play in the years to come. Current studies indicate that only about 32% of major universities stated they had no intention of pursuing Massive Online Open Courses (Allen & Seaman, 2013). The rest have either implemented or remain in discussion about implementing MOOCs. Despite these currently low implementation rates however, the universities that have chosen to pursue them are among the most well-known and prestigious in the world. Stanford, MIT, Oxford, Princeton and Tokyo University, are just a few of the broad roster of participating universities from around the world (Baggaley, 2013; Fox, 2013).

While individual MOOC practices can vary drastically, they typically agree upon several general characteristics. Typically, MOOCs are defined as being online courses with no cap on enrollments, minimal to no student costs, and no prerequisites or enrollment restrictions (Allen & Seaman, 2013; Yuan & Powel, 2013). While some courses are open, but not massive; others are massive, but not open. This makes even such a finite subcategory of online learning as a MOOC difficult to clearly define. While these types of courses share a great deal of traits with prior online learning formats, their potential to reach such a massive audience, at a theoretically minimal cost, has sparked

the interest of many (Trucano, 2013; Fox, 2013). Despite their potential however, these courses suffer from one of the highest attrition rates of any classroom formats.

Completion estimates typically range between 5-20% (Ry, 2013; Baggaley, 2013). At its core, this is the dilemma this research sought to examine.

Through a series of exploratory interviews, this study examined what factors contribute to student motivation and engagement in Massive Online Open Courses. Drawing on prior literature from both online/distance learning and motivational theory, this study conducted a series of semi-structured interviews in order to explore what variables impacted student motivation and engagement outcomes. Findings regarding student experiences and observations were then explored in relation to other studies in the field in order to examine the ways in which this study's data either supports or contradicts the existing body of research. Following these general observations of student experiences, interview results are then reviewed in relation to the motivational theories of Self-Determination theory, Socio-cognitive theory, and Expectancy Value theory to explore the potential of these models in understanding and assessing program participation and achievement behaviors. Although limited in scope and scale, it is hoped that the findings of this exploratory analysis may provide additional insights in order to help develop and direct future research on the subject.

## **1.2 Research Questions:**

At its core, this study seeks to address the five primary lines of inquiry below:

- 1) What were participant's general experiences and perceptions regarding their experience in MOOC programs?
- 2) What factors reportedly impact students' perceptions of satisfaction, engagement, achievement, and learning outcomes in MOOCs?
- 3) How do MOOC participants utilize and interact with these programs?
- 4) In what ways, and to what extent, can the motivational theories of SDT, SCT, and EVT be used to understand and explain learner behavior in MOOCs
- 5) How do the findings of this research support the existing literature in the study of MOOC and Online Education (OE)?

## **Part 2 - Literature Review**

### **2.1 Distance and Online Education**

Online Education (OE) is generally classified as being the most recent incarnation of a long history of Distance Education (DE) (Sumner, 2010; Bernard, 2004). A concept first attributed to postal-based education programs of mid-19th century Europe and U.S., DE has adapted and evolved alongside the various technological innovations of the last few centuries (Sumner, 2010). From the use of radio and video technologies, to today's vast myriad of online learning formats, Distance Education has continuously changed and expanded. While online education shares many of the characteristics and practices of

other DE formats, its unique ability to challenge longstanding barriers has made it one of the most influential forms of distance learning seen to date (Sumner, 2010). Some have even proposed that online learning has spurred a “transformative revolution” and played a major role in reshaping the landscape of education as we know it today (Bonvillian & Singer, 2013; Baggaleu, 2013; Cusumano, 2013). Unlike many versions of DE, online education has made significant headway in penetrating the mainstream educational industry (Allen & Seaman, 2013). Despite its increasing acceptance however, OE has continued to suffer from many of the longstanding criticisms of DE. Many have contended that online learning environments cannot replicate key elements of traditional education such as personal interactions or authentic communities of learning (Sitzman & Leners, 2006; Hockridge, 2012; Robertson, 1998). Other, more recent, critics of online learning have pointed to issues tied to credentialing (Bonvillian & Singer, 2010; Allen and Seaman, 2013), quality control (Daniel, 2012; Noble, 2002; Palloff and Pratt, 2000), or socio-economic repercussions (Carr, 2001; Cusumano, 2013; Fox, 2013) as potential concerns. Despite such criticisms, both technology and market demands have continued to push efforts to expand the field, bringing it ever increasing public attention and innovation (Cusumano, 2012)

As the means for remote interaction, data collection, and automated interfacing have expanded and advanced, so too have the opportunities of online learners. New resources such a video-chat, real-time messaging boards, and interactive lesson interfaces, have begun to undermine longstanding criticisms about online and distance learning environments (Fini, 2009; Garrison & Archer, 2000). Such innovations have

fueled the increase in institutional use of online learning resources over the last few decades (Bonvillian & Singer, 2013). Online courses and integrated Learning Management Systems (LMS), such as Ilearn or blackboard, have become common facets of most higher education institutions in the United States (Fini, 2009; Kop, 2011). One study indicated that, from 2002 to 2013 alone, the percentage of academic planners and administrators that reported online learning as being “critical” to their long-term strategy rose from approximately 40% to nearly 70% (Allen & Seaman, 2013).

In addition to this increasing technological innovation, shifts in pedagogical theory have also bolstered the arguments for the potential uses of online learning environments (Bonvillian & Singer, 2013). From Seaman and Downs’ proposed connectivist educational model (2005, 2008), to the large body of literature challenging teacher-centered learning models (Ligorio, 2010; Nystrand, 1997, Svinicki, 2004), educational research has increasingly questioned the longstanding practices once thought paramount to face-to-face (F2F) instruction. Some have argued that this new body of literature has resulted in “dual revolution” in which the shifts in pedagogical theory have coincided, and even supported, the rise in online learning as a viable option (Bonvillian & Singer, 2013). Whatever the reasons, the rapid increase in online education has ignited the interest of researchers and practitioners alike as many efforts have attempted to develop best practice approaches to improve online learning (Ragan, 2012; Bernard Et al., 2011; Palloff & Pratt, 2000; Artino , 2008).

Despite these efforts to improve or standardize online programs, much about the topic remains unknown and studies have often proven somewhat inconsistent in assessing

the actual outcomes of online programs. Many studies, such as Barbara Means' 2009 Meta-analysis of online education research, have indicated the potential for superior learning outcomes in online learning environments. Others have been less confident in the quality of stand-alone online education; advocating instead for blended/hybrid programs (Bonk, 2009; Boylea, 2010; Bonvillian & Singer, 2013) or viewing online programs as inferior or non-preferable means of instruction (Sherritt, 1996; Pallof & Pratt, 2000). In general however, there appears to be little clear patterns in research findings. The work of Bernard et al. (2011) illustrates this point well. In this study, a meta-analysis of over 230 studies on student achievement, attitude, and retention outcomes in distance and online learning environments yielded no clear pattern. While some DE and online courses excelled beyond traditional classroom formats, others fell significantly shorter than their F2F counterparts. Exploring similar findings in his own comparative analysis, Graeme Salter (2003) emphasized the need to recognize the diversity within online learning environments. His work concluded:

online technology has the potential to enhance and transform teaching, but it can also be used inappropriately or in ways that actually interfere with learning. The real question is not whether effective learning can occur online, but rather how this can be most appropriately achieved? (p. 140).

While polarized extremes can be seen on both sides of the argument, the last two decades have seen a steady increase in the advocacy of the middle ground (Bonk, 2006; Fox, 2013, Boylea et al., 2010). Researchers and practitioners alike have begun to explore the ways online learning can be best blended with traditional educational institutions to



maximize student outcomes. In one such proposal, Sanjay Sarma, the director of MITx (MIT's online course development entity) suggested that massive online education could be used to streamline first order learning and allow limited class/campus hours to focus on higher order discussion and analysis (as Cited in Bonvillian & Singer, 2013). While this view shows how hybrid practices could work within an individual classroom context, others have advocated for the selective implementation of online programs to improve access at a more macro-scale (Bonvillian & Singer, 2013). Many introductory level courses, for example, are highly content and lecturer driven and may be more easily adapted to an online model than higher level courses focused on writing, discussion, or analysis. This selective implementation of online and live courses could potentially free up impacted introductory courses and allow staff to focus their time on higher-level course offerings.

Beyond just the potential for institutional uses, individuals can also use online learning to their own particular ends. Downes (2009) claimed that through the creation of online Personal Learning Environments (PLE), allotted by the diversity of online resources, people become active agents in shaping their own academic progress and direction. This freedom could allow them to seek resources to supplement traditional courses as needed, or could be used as stand-alone tools to help gain information and expertise that may have otherwise been unavailable due to financial, locational, or temporal constraints. In fact, the lifeline learning and the informal uses of online educational resources is among one of the well-documented motivations in online learning (Kassop, 2003; Wilson, 2007; Yuan & Powel, 2013).

Despite these potential benefits however, many have argued that new online technologies represent as much of a detriment as they do benefit. Several economists, for example, have argued that the rise of private online learning and the introduction of massive online courses may threaten to undermine the traditional financial structures at the core of the academic industry (Bonvillian & Singer, 2013; Fox, 2013; Cusumano, 2013). Even in the case of accredited online courses, hosted by mainstream educational institutions, there is a common concern that the operating costs of online programs may outweigh program benefits (Carr, 2001). Moreover, many have expressed concerns over the ability of faculty members to control their intellectual property in online formats (Peralta, 2012; Barrett, 2013). Private interests are also a common concern about learning. With the increasing role of private for-profit entities in online education, some have even gone so far as to argue that many online schools are little more than “Diploma mills”, with profits trumping student education as the primary objective (Noble, 2002; Fox, 2013). Even in the case of publicly funded or non-profit online programs, concerns regarding the quality of online the programs and the recognition of credentials remain a prevalent barrier in the views of students and institutions alike (Allen and Seaman, 2013).

Beyond just financial and logistical concerns, there also remains a large body of critics who point to potential issues in pedagogical practices. As mentioned prior, the perceived lack of authentic interaction or active learning communities are among the most commonly cited apprehensions regarding online learning (Daniel, 2012; Palloff & Pratt, 2000). Despite deliberate efforts to increase the social atmosphere of DE, many studies have indicated that active participation rates remain low (Milligan et al., 2013,

Fini, 2009; Kop, 2011). Furthermore, despite the mixed findings in regards to learning outcomes, several research studies have noted a marked distinction in student satisfaction and perceptions of program quality (Allen and Seamen, 2013). Students often report lower perceptions of quality and satisfaction in online programs than they do in face-to-face courses (Means, 2009; Bernard et al., 2004; Johnson et al., 2000). Other critics have pointed to issues pertaining to program quality control (Baggaley, 2013), student honesty and self-regulation (Salter, 2003; Allen & Seaman, 2013), and technological barriers (Valentine, 2002; Kop, 2011) as potential concerns.

Even as technological advances seek to break down longstanding learning barriers in online formats, many feel these programs still have a ways to go. Mackless et al. (2010), for example, contended that the “Connectedness” afforded by interface did not necessarily increase the quantity or quality of online interactions. Similarly, Palloff and Pratt (2000) warned against the dangers of over-dependence of automation, arguing that it is important to keep in mind that “technology does not teach students; effective teachers do” (Palloff & Pratt, 2004. p4). In fact, despite the many efforts to rectify online learning’s shortcomings, longstanding criticisms persist. One study indicated that roughly 23% of educational professionals continue to view online learning as substandard or inferior to traditional classroom formats (Allen & seaman, 2013). Sheritt’s (1996) paper portrays this mentality well by describing online courses as a “necessary but deficient form of education” (Sheritt, 1996. p2). Despite the abundance of such mentalities however, this view is that of an increasing minority. Educational practitioners and administrators alike have demonstrated an increasing trend toward the acceptance and

application on online learning environments (Allen & Seaman, 2013, Bonvillian & Singer, 2013). In reality, the bulk of research seems illustrate that the quality, legitimacy, and academic outcomes of online programs, are as diverse and ambiguous as the range of online programs and practices are themselves.

This broad diversity of program types then leads us to another major issue in research about online learning: typography and classifications (Lund & Volet, 1998; Schlosser & Simonson, 2009; Todhunter, 2013). Although many have tried to categorize or distinguish between the various types of online learning formats, the creation of a comprehensive typography is still far from achievement. Attempts have ranged from the 4 broad categories utilized by Allen & Seaman (2013) (Online, Hybrid, Computer Aided, and Traditional), to Barrie Todhunters' (2013) 7 category expansion, to studies examining the seemingly endless combinations of Personal Learning Environments (PLE) (Wilson, 2007; Downes, 2009; Fini, 2009; Kop, 2011). Overall, it seems there is little-to-no agreement on how to best classify and examine online learning formats. It is no surprise then that, with such blurred lines in classifications, research has demonstrated such mixed results. While some have strived to redirect the argument toward looking at particular practices and models (Salter, 2003; Todhunter, 2013), overgeneralizations in research remain rampant and have fueled a tendency towards polarization, misrepresentation, and hyperbole (Daniel, 2012; Todhunter, 2013). Rather online learning represents the way of the future, a necessary evil, or a passing fad, remains a matter of debate. The increasing significance and presence of online education however, is undeniable. As a result, there is an ever-increasing need for research in the field and

targeted studies on how the various formats of online education can impact students and educators.

## **2.2 MOOCs**

The term Massive Open Online Course (MOOC) refers to an educational genre that represents a vast myriad of online program approaches and structures. In general, MOOCs are characterized as being large-scale (often uncapped) online courses that typically do not have any prerequisites, fees, formal accreditations, or predefined levels of required participation (Cormier et al., 2010; Siemens, 2012). Despite this general categorization however, individual MOOCs vary greatly in the extent to which they meet these criteria. While many have boasted the potential of MOOCs to reshape educational access and structures, improve educational access, and drive down the high costs of higher education ( Bonvillian & Singer, 2013; Yuan & Powel, 2013; Siemens, 2012), others have pointed to concerns tied to their academic legitimacy and quality (Daniel, 2012; Baggaley, 2013), or socio-economic repercussions (Trucano, 2013; Cusumano, 2013). Regardless of these controversies however, MOOCs have garnered an incredible amount of attention since the term was first coined in 2008 (Cormier, 2008). So much so that, in 2012, The New York Times ran an article hailing it as the “year of the MOOC” and espousing the ability of such programs to revolutionize education as we know it (Trucano, 2013; Bonvillian & Singer, 2013). This rapid rise in recognition has spurred attention as many of the world’s top institutions and leading technological companies have rushed to jump onto the MOOC bandwagon (Liyaganawardena et al., 2013). Despite the outpouring of social support however, MOOCs remain a new area of study

with innovation often outpacing research in attempts to understand and classify this unique educational model.

Although most of the elements commonly ascribed to a MOOC are drawn from longstanding practices and concepts in online and distance learning, the conceptual classification of a MOOC is a relatively new development (Bonvillian & Singer, 2013). The term was first used by Dave Cormier (2008) as a means of describing George Siemens and Stephen Downs' experimental online course (Yuan & Powel, 2013). This course, titled "Connectivism and Connective Knowledge" (CCK08), was used as a demo of a peer driven massive online open learning environment (Liyanagunawardena et al., 2013). Building on a broader theoretical basis of connective learning in pedagogical practice, CCK08 was used as an alternative model to running online programs. This contrast gave a label and a newfound focus to the nascent field of Massive Open Online Education (MOOC), as well as, created the outline for the xMOOC/cMOOC typography that remains prevalent in research literature today.

The first of these sub-categorizations, labeled Extended Massive Open Online Course (xMOOC), is a type of online course that largely mirrors the longstanding practices in both F2F and DE (Siemens, 2012). In this format, teachers play a central role by giving lectures, grading works, and providing feedback, typically on a set schedule (Siemens & Downes, 2008). Being built upon a behaviorist model of learning, knowledge transmission is typically the primary goal within this style of massive online course (Cormier, 2008; Baggeley, 2013). Given the large class sizes in these open online formats, remote testing and credit/no credit writing assignments paired with

posting/messaging requirements tend to create the bulk of student participation (Fini, 2009; Miligan, 2013). Even as computer and internet technologies increasingly develop innovative and interactive interfaces, improving the possibilities for inter-student communication, many MOOCs and traditional online courses maintain this model (Liyaganawardena et al., 2013).

CCK08, in contrast, was labeled as a “Connectivist MOOC” or “cMOOC” (Siemens & Downes, 2008; Baggaley, 2013). This model builds from a connectivist theory of learning that emphasizes learning as a social process. The role of the teacher is shifted from central agent to that of a facilitator or an absentee. Grading is often crowd-sourced to peers, tasks frequently involve dynamic automated interfaces, and the focus is placed on “knowledge creation and generation rather than knowledge duplication” (Siemens, 2012. p12). Ever since CCK08, MOOC’s have seen a rapid increase in both public and private interests and new MOOCs have appeared in nearly countless forms and formats (Bonvillian & Singer, 2013; Liyanaganawardena et al., 2013).

Historically, the idea of the massive open online course is typically thought to have originated out of the Open Education Movement (OEM) and a rising trend in Open Education Resources (OER)(Yuan, et al., 2008; Liyanaganawardena et al., 2013). Today however, the economic landscape of MOOCs is much more diverse and extensive. While some providers, such as Ed-x and Khan Academy, maintain a non-profit status, many for-profit entities like Ed-x, Udacity, and Udemy have become prominent figures in the field (Yuan & Powel, 2013). Moreover, despite its grassroots origins, today’s “MOOC Industry” is dominated by top tier universities and large private interests (Fox, 2013;

Allen & Seaman, 2013). From Harvard and MIT to Cambridge and Tokyo University, many of the world's most prestigious educational institutions have lent their hand in the implementation and development of MOOCs. In fact, Ivy League institutions are generally considered to be the primary advocates leading the charge of research and development (Baggaley, 2013). Large-scale non-academic contributors, such as Google and the Bill Gates Foundation, have also been key entities in supporting the development and continued study of MOOCs (Trucano, 2013; Bonvillian & Singer, 2013). Ed-X, for example, represents collaborative effort between MIT, Harvard, Google, and over 30 other well-known universities from around the world (Liyanagunawardena et al., 2013). Despite many concerns about the legitimacy and economic viability of MOOC formats, over a hundred million dollars in development funding had been provided to the three largest MOOC providers (Ed-x, Coursera, Udacity) alone as of 2012 (Yuan & Powell, 2013). With such overwhelming support, it comes as no surprise then that MOOCs have rapidly expanded and evolved over the last few years.

This rapid growth and development has resulted in a broad diversity of models and practices and MOOCs, much like the broader field of OE research, have begun to defy simple classifications (Liyanagunawardena et al., 2013; Baggaley, 2013). Some courses are open but not massive, others massive but not open. Some are privately owned, some are non-profits, and all offer varying levels and types of teacher or student participation. This diversity has spurred many questions. At what point is connective learning no longer formal enough to be considered a course? Does a collection of YouTube videos on single a topic with a forum constitute a user shared interface like a



cMOOC? Does it need some minimal test to count? Even if the videos and tasks are arranged together in a clear sequence, does it require grading? These and many other questions plague attempts at simple typographic classification and many have argued that such confusions have severely hindered the research efforts within the field (Daniel, 2012; Yuan & Powel, 2013, Todhunter, 2012). Having come a long way from the point when researchers first coined the binary classifications of cMOOC and xMOOC, a great deal of ambiguity can now be seen in the literature surrounding MOOCs. Although clear classification is lacking, interest and debate on the subject is certainly not. This combination of ambiguity and interest have sparked many heated debates with polarization and myths running rampant in the dominant discourse (Daniel, 2012)

On the advocacy side, many argue that MOOCs represent powerful tools for improving access to information and educational affordability. In this regard, they provide new realities to the long espoused potentials of online learning (Liyanaawardena et al., 2013; Bonvillian & Singer, 2013). Far from just catering to a small population of lifeline learners, MOOCs arguably have the potential to radically restructure the world of education as we know it. From supplemental uses, to institutional operating cost reductions, to the ability to transcend traditional time and location barriers to educational access, the proposed benefits of these programs is expansive to say the least (Yuan & Powel, 2013; Bonvillian & Singer, 2013). Many argue that MOOCs have the potential to offer top tier education from many of the nation's most prestigious institutions to people whom may have never thought such opportunities were possible (Baggaley, 2013). Others have proposed the potential of these programs to supplement

traditional education in various ways (Bonvillian & Singer, 2013; Liyanagunawardena et al., 2013).

MOOC are also frequently hailed for their potential role in aiding educational research efforts. Given the large class/sample size paired with the inherent data collection imbedded in online interfaces, many believe MOOC can provide a great deal of information on student learning behaviors (Yuan & Powel 2013; Allen & Seamen, 2013). Even the fact that they remain an outlier to mainstream education is often seen as being a research advantage. Not being bound by the same levels of structure or bureaucracy as typical accredited online courses are, MOOCs have provided a fertile ground for educational experimentation and adaptation (Fini, 2009, Yuan & Powel 2013, Kop, 2011). Ranging from the development of complex assessment and achievement tracking mechanisms, to the exploration of social networks and 3D environments, MOOCs have allowed educators an opportunity to explore new ways of engaging students (Fini, 2009). New internet technologies and interfaces such as Facebook, Indeed, Twitter, Moodle, and countless others have been regularly integrated into MOOCs seeking to use cutting edge technologies to foster student interaction and develop communities of learners from around the world (Fini, 2009; Liyanagunawardena et al., 2013). MOOCs have even been considered a forerunner in the field of mobile education, as cell phones, tablets, and mobile devices are commonly utilized tools in many MOOC programs (Kop, 2011). In short, the combination of MOOC's malleability alongside the aforementioned potential for data collection and analysis, make a strong case for the potential value of MOOCs as a tool for educational research.

Detractors from MOOCs argue that these formats can reduce educational quality, (Baggaley, 2013) lack a clear business model (Yuan & Powel, 2013), or may even actually exacerbate socio-economic inequalities of education (Trucano, 2013; Cusumano, 2013). Many of the same concerns noted about online learning are carried over to MOOCs, often to a hyperbolic extent. These include concerns about the viability of meaningful interaction (Kop, 2011; Milligan, 2013), issues of student honesty (Siemens et al., 2012), and questions about teacher and program quality controls (Baggaley, 2013). Moreover, no clear mechanism for rating MOOCs has yet been applied. Instead, many programs are currently rated by the scope of course offerings rather than by the actual quality of the programs or staff (Daniel, 2012). In the case of connectivist models, some critics have noted concerns about the acceptance of forced peer interaction or the potential for misdirection or miss-correction (Milligan, 2013; Kop, 2011).

Financially too, some have contended that the potential for MOOCs to reduce university expenses is highly over-exaggerated and is part of a “technological hype cycle” that will soon fade (Trucano, 2013; Cusumano, 2013). In fact, concerns about the lack of a clear business model for MOOC are among their most prominent issues discussed in relation to institutional adoption of such programs (Allen & Seaman, 2013, Liyanagunawardena et al., 2013). While static video collections are generally easy to maintain, dynamic MOOC’s that actively seek to foster student engagement and overcome perceived barriers to OE are far more difficult and expensive to run than commonly anticipated (Carr, 2001; Yuan & Powel, 2013; Cusumano, 2013). Despite a general belief and consumer expectation that such programs should be cheaper for

students, the actual operating costs of MOOCs often matches or exceeds those of face-to-face classes (Allen & Seaman, 2013). Most studies weighing the cost/benefit of MOOC models stress that class sizes must reach a nearly unmanageable scale before they can become truly cost effective (Cusumano, 2013, Liyanagunawardena et al., 2013). This has ignited concerns about the potential tradeoff between cost efficiency and educational quality.

At a more ideological level, others have challenged the idea that MOOCs can foster a more egalitarian system of education (Trucano, 2013; Cusumano, 2013). While improvements in access may help overcome financial barriers, some theorist have warned of the potential development of a classist system of education in which the rich can go to real schools while the less well-off are limited to online learning environments. Moreover, ethical debates regarding the use of MOOC data are a newly arising topic of discussion. Many have begun to question whether the mass online collection of student data is desirable or appropriate (Liyanagunawardena et al., 2013).

While these polarized views on the pros and cons of the MOOC take many shapes and forms, one of the most tangible elements discussed across the board is the shockingly low completion rates. With attrition rates typically ranging from 85-96%, it is clear that the vast majority of students do not complete MOOCs (Liyanagunawardena et al., 2013; Ry, 2014). Various reasons have been cited for this and include: a lack of motivational factors, perceived poor quality of instruction, or a lack of official certification or recognition. Others however, have argued that such indicators do not accurately reflect these programs as they do in traditional learning environments. Andrew Ho, for example,

is a MOOC researcher out of Harvard University who adopts this viewpoint. He contends that such critiques of the high drop out rate have “largely missed the point” (As cited in Rivard, 2014 p4). Drawing on his own studies of CCK08, Ho’s findings contend that, given the nature of student uses of MOOC programs, “completion may not be an adequate indicator of quality” (p6). Due to the large number of participants using these programs to support lifelong learning, many who enroll have no intention of completing a course in its entirety. Several other study’s findings have supported this idea demonstrating that a large number of students are simply dabbling in a topic or fishing for a specific concept or skill (Fini, 2009; Kop, 2011; Milligan, 2013). Whatever the reasons, attrition rates remain high and are often a key topic in debates surrounding MOOCs.

Another major factor in the debate surrounding MOOCs is the idea of accreditation and social recognition (Allen & Seamen, 2013; Yuan and Powel, 2013). Unlike mainstream OE formats, that offer students tangible outcomes such as accredited degrees or vocational certifications, most MOOCs boast purely non-tangible outcomes with little-to-no social value. Unaccredited “hacked” certificates or online badges of achievement are commonly seen incentives within MOOCs and typically provide very little real world capital for program participants (Yuan & Powell, 2013; Bonvillian & Singer, 2013). Although many programs like Coursera and Ed-X offer certificates boasting the name of top tier universities like Harvard, MIT, or GeorgeTown; the legitimacy and value of these quasi-affiliated certificates remains largely unknown. Fears about the potential of these credentials to confuse employers and complicate job markets

are among the top concerns voiced by many academic officials when discussing MOOCs (Allen & Seaman, 2013). This too is changing however, as there has been an ever increasing trend towards credentialing and academic legitimation amongst MOOC programs.

Recently, multiple providers have begun to offer recognized academic credits for MOOCs. In 2012, Antioch University, in partnership with Coursera, became the first university in the US to offer formal academic units for the completion of a MOOC program (Liyaganawardena et al., 2013). By early 2013, the American Council on Education recommended another 4 other Coursera courses for academic units. Even at the level of secondary education, programs have begun to sprout up offering MOOCs for high school students seeking to take the GRE or as supplemental resources for SAT preparation (bonvillian & Singer, 2013). Despite these significant steps however, a great deal of uncertainty remains about how MOOC providers will continue to be able to ensure quality control and student honesty in contexts of such massive enrollment and remote participation (Cusumano, 2013). Even outside of education, MOOCs have begun to take on broader social roles.

In recent months, Khan Academy has begun a collaborative campaign with Bank of America intended to support general financial awareness and to help aspiring students navigate the financial aid process. Many employers have also recently begun looking at MOOC for staffing and recruitment, with several companies using such programs to train and source specialized staff (Liyaganawardena et al., 2013). While the outcomes of

such efforts remains to be seen, the shift of the role of MOOC from education to social or corporate agendas may prove an interesting trend in the years to come.

Ultimately, while MOOCs may not be responsible for revolutionizing or destroying education as we know it, there is no denying they have left a lasting impact. Through their rapid expansion and evolution following CCK08, MOOCs have forced many to reassess the promises and potentials of distance learning. While a great deal of research has begun to examine this unique educational model in recent years, few have explored the constructs of motivation in MOOC to an extensive degree. Further exacerbating this research gap, is a tendency for research to focus on active or completing participants. Few studies have incorporated the feedback of inactive or discontinued students in MOOCs in their analysis of participants (Milligan, 2013).

### **2.3 Introduction to Motivational Theory**

The field of motivational studies has a long history in academia. From Socrates, to Freud, to the vast multitude of contemporary researchers, many have strived to understand and explain differential motivation and achievement behaviors (Graham & Weiner, 1996). Past studies have found that motivation is among the most important factors in determining educational outcomes in both classroom and online learning contexts (Maehr, 1985; Lim, 2004). Motivation has been tied to everything from student satisfaction (Fujita-Starck & Thompson, 1994), to outcome achievement (Eccles et al., 2002; Pintrich & Linnenbrink, 2002), to perseverance and metacognition behaviors

(Vallerand et al., 1997; Ames & Archer, 1988). Understanding what causes one student to succeed and another to fail, lies at the very core of efforts to shape education policies and institutions. While many theoretical models for understanding motivation have been proposed, few are as widely accepted and applied as Self Determination Theory (SDT), Socio-Cognitive theory (SCT), and Expectancy Value Theory (EVT).

## **2.4 Self Determination Theory**

Self-determination theory is one of the most recognized and widely applied models for understanding motivation and behavior. Arising out of a body of research seeking to distinguish between intrinsic and extrinsic motivation, Ryan and Deci's (1971) study of undergraduate college students' motivation and achievement patterns sought to understand how extrinsic factors became intrinsic motivation through the use of differing incentives. Their studies concluded that verbal recognition worked better than monetary compensation for fostering the internalization of motivation. These results, paired with similar research findings by Pritchard, Campbell and Campbell (1977), led to a larger discussion on how psychological desires mediated the effects of external incentives. These studies ultimately laid the foundation for the development of modern Self-Determination Theory.

By the 1990s, through continued research and publication, Ryan and Deci had refined their theory to state that, "motivation, performance, and development will be maximized within social contexts that provide people the opportunity to satisfy their basic psychological needs for competence, relatedness, an autonomy" (Ryan & Deci,



1991 p327-328). In this model, competence refers to ones perceptions of ability and feelings about their potential to overcome limitations. Multiple studies have indicated that simple practices like goal/step setting or providing regular performance feedback can have significant impacts on student motivation and engagement behaviors (Reeve, 2002; Ragan, 2012). The second core component of SDT is relatedness. This is generally defined as ones feelings connectedness to content, community, or other individuals. Communities of inquiry (Kop, 2011), pedagogical caring theory (Wentzel, 1997;), positing theory (Yoon, 2008; Harre, 1998), are just three of any number of theoretical models in education that are built on the perceived importance of such relational dynamics. The third and final element listed in SDT is Autonomy. According to Ryan and Deci's (2010) review, Autonomy refers to how much one views themselves as causal agents in their own life. Once again, research has repeatedly demonstrated this proposed relationship between autonomy support practices and student motivation and achievement patterns (Vallerand, 1991; Grolnick, 1989; Ryan & Deci, 1987). Simple autonomy support practices, like allowing for paper topic selection or providing assignment contextualization, are often strongly linked to student engagement patterns and frequently addressed in educational best practice guides (Reeve, 2002; Ragan, 2012).

In more recent years, Ryan and Deci's works have remained seminal in the fields of both education and motivation. Even beyond educational contexts, SDT has been applied to everything from environmental activism (Pelletier et al., 1998) to counseling and drug/alcohol aversion programs (Markland et al., 2005; Knee & Neighbors, 2002). Many have even begun exploring the ways in which SDT as a theoretical model can carry

over to online learning environments (Lee & Cheung, 2005; Chen & Jang, 2010; Rocaa & Marylene, 2008). Thus far however, research attempting to map Self-Determination Theory onto online learning environments has been somewhat limited and inconsistent (Chin & Jang, 2010). Some have argued that the key elements of SDT (autonomy, relatedness, and competency) can, in fact, be used as predictive indicators to student engagement and achievement behaviors in online learning environments (Standage et al., 2006; Artino, 2008; Reeve, 2002). Others studies however, have been less supportive of this claim. In the study by Chem and Jangs (2010), for instance, they stated

Results from structural equation modeling provided evidence for the mediating effect of need satisfaction between contextual support and motivation/self-determination; however, motivation/self-determination failed to predict learning outcomes (p. 741).

Despite this study's inability to link motivation to learning outcomes, the core concepts of SDT remain common components in many studies regarding online learner behaviors.

In Kop's (2011) study, she contended that students must possess certain "critical literacies" in order to succeed in online education. These "critical literacies", as well as other language or technological barriers, are commonly believed to impact student perceptions of competency and relatedness in online programs (Kop, 2011; Fini, 2009). The concept of autonomy is also a very common topic in studies related to MOOCs. In almost every publication about OE or MOOCs, the authors will talk about the greater

level of autonomy. Very few studies however, actually seek to tease out the exact relationship between autonomy practices and student engagement and achievement behaviors in online learning (Fini, 2009; Chin & Jang, 2010). Of those that have attempted, most have yielded mixed results and point to the multifaceted nature of student of motivation as the explanation for differentials in findings. In Milligan's (2013) findings, for instance, student autonomy was cited as being a primary factor for both active and inactive participation patterns. While many of the study's more active students praised the ability to control their learning and timeframe, others pointed to autonomy as a primary reason for their struggles. "Inactive learners" commonly expressed concerns about autonomy interfering with needed direction or reducing accountability. In Kopps' (2011) study of PLENK, she too, found that although learners praised the efforts of autonomy support in the program, they often viewed it as being of secondary importance to program support. Ultimately, it seems that much research remains to be done in developing a fuller understanding of the ways in which the tenants of SDT impact online learners.

Regardless of the mixed efforts, SDT may still prove a powerful framework for furthering our understanding of online learner behaviors. With its focus on instructional dynamics in relation to student outcomes, SDT may prove a beneficial tool for examining contexts in which technological capabilities have restructured classroom inactions, created new opportunities in regards to versatility and autonomy, and added a new layer of technological interface skills that can impact student sense of competency (Vallerand et al., 1997; Downes, 2009; KOP, 2011). Given that all these factors have proven

significant in shaping student outcomes in traditional classroom contexts (Ryan & Deci, 2000), it may be prudent to continue research into the way Self-Determination Theory can be used to understand and improve online education practices.

## **2.5 Socio-Cognitive Theory (SCT)**

Socio-Cognitive Theory (SCT) is likely the most expansive and inclusive of the three frameworks utilized in this study. Having evolved a great deal since its original incarnation, this theoretical model addresses many similar factors to Self Determination Theory but places far greater emphasis on the role of socialization. While SDT sought to recognize how external environments (such as autonomy-supportive atmospheres) were mediated by internal drives, SCT sought to understand why; if behaviors were driven by fundamental internal drives, variation occurred both between and within various individuals' actions (Bandura, 1971). Challenging the notion of universal drives, Bandura (1971) argued that, "An internal motivator cannot possibly account for the marked variation in the incidence and the strength of a given behavior in different situations, towards different persons, at different times, and in different social roles" (pp. 1 - 2). Instead, Bandura proposed that motivation was a social process and that, "man is neither purely driven by inner forces nor buffeted helplessly by environmental influences" (p. 10). He contended that behavior and motivation are the byproducts of the reciprocal interaction of personal, behavioral, and environmental factors and often learned through processes of social interaction and observation. In seeking to support this claim, he conducted a series of experiments, commonly referred to as the Bobo Doll Experiments.

In these experiments children were found to replicate modeled behaviors of aggression (Bandura 1959; Bandura 1962). Building upon these findings further, he contended that, rather than just a direct replication of observed behaviors, learning was mediated by a complex series of factors. Mode of learning (direct/vicarious), individual self-efficacy beliefs, outcome expectations, and goal-setting/self-regulation behaviors, were all noted as mediating factors to behavioral outcomes (Bandura, 2001).

Since Bandura's initial work on social learning theory, a large number of studies have been published supporting and expanding upon this model. Pintrich and De Groot (1990), for example, strived to reaffirm and re-articulate many of the core tenants of SCT. In their 1990 correlational study of learner self-regulation, they argued that the socio-cognitive theory of motivation and learning can be broken down into six motivational constructs which, in turn, can be classified into three general families: Perception about ability, perceptions of goal and purpose, and individual strategy uses (Pintrich & De Groot, 1990). Perception of ability refers to a student's sense of self-efficacy, locus of control, and outcome attributions. Goal/purpose refers to factors such as goal orientation and intrinsic/extrinsic motivators. Lastly, individual strategies refers to metacognitive strategies and self-regulatory processes. Ultimately, it has been proposed by proponents of SCT that, learning (and motivation) is a multidimensional byproduct of the complex interplay between these factors. Moreover, they content that these factors are themselves heavily influenced by an individual's history of socialization within various cultures and communities (Bandura, 1971; Pintrich & De Groot, 1990).

Since its origins in Bandura's work, through its refinement over the years, a vast array of research has continued to support many of the key concepts of SCT and fostered the development of multiple sub-theories tied its core concepts (Bandura, 2001). Bernard Weiner (1985), for instance, developed a sub-theory of SCT commonly referred to as Attribution Theory (AT). In this theory, socialized beliefs about the causes of success or failure (i.e locus of control, ability v. effort) demonstrated a significant correlation with motivation and achievement outcomes. By comparing high school students' motivation and perseverance on a task relative to the outcome attributions and perceived locus of control they reported, Bernard's works found strong evidence supporting their interconnectedness. In short, in atmospheres that encourage students to see themselves as having control of their circumstances (i.e. praising effort instead of ability or attributing failure to circumstantial factors), students were more likely to continue to attempt task after exposure to failed attempts (Bernard, 1985).

Similarly, Carol Ames' (1988) work in Goal Orientation Theory (GOT) draws upon and expands upon the Socio-Cognitive Model. Ames researched the ways in which learned goal behaviors shape motivation and perseverance. In her study, she examined how goal orientations impacted motivation and engagement patterns by looking at the effects of info sessions intended to foster one orientation or another on task behaviors following the session. Her study found that students who were influenced to focus on the value of the task itself, or the process of mastery, were more likely to adopt a mastery orientated goal focus and showed greater resilience, metacognition, and dedication when faced with difficult tasks. Students exposed to videos on scores, rewards for high grades,

or other concepts intended to foster performance orientations, were found to have less task perseverance (Ames, 1988). GOT also stresses the role of social atmospheres in constructing the goal orientations that ultimately shape engagement and achievement behaviors expressed. While research such as that of Pintrich, Bernard, and Ames have continued to demonstrate the significance and potential of Socio-Cognitive Theory in traditional classroom settings, the theories implications for online learning have only just begun to peak academic interest.

Several researchers have begun the arduous task of overlaying the complex concept of SCT onto online learning environments. Miltiadou and Sanenye (2013), for example, drew upon a large body of literature to examine the ways in which SCT has been utilized in relation to online learning. These efforts identified some interesting practical guidelines and pointed to the many gaps in literature regarding motivation in online learning. They identify practices such as technological instruction and early feedback as being important to student self-efficacy and for modeling participation behaviors. Given that so much emphasis is often placed on the important of self-regulation in online learning, and that previous studies have linked these metacognitive behaviors to goal and attribution orientations, SCT may prove an important model for furthering our understanding of online learner behaviors in online learning environments.

Ultimately however, most research seeking to examine the role of SCT in online learning concludes that much remains unknown about motivation in online learning environments. Insufficient research has been done on the roles of attribution or goal orientations in online learning environments. Despite the minimal research available,

Socio-cognitive theory may prove a beneficial model in examining motivation in online learning. Examining how goal orientations, student attributions, or social influences impact student outcomes in online learning, may help shed light on enrollment and attrition rates or guide future efforts at educational improvement.

## **2.6 Expectancy Value Theory (EVT)**

First put forward by John Atkinson in the late 1950s, Expectancy Value Theory (EVT) is an attempt to provide a cost/benefit model for understanding motivation and achievement behaviors. At its very most basic level, this theory posits that most human behaviors can be seen as the outcome of a constant assessment of any given action's perceived task expectancy and value (Atkinson, 1957). Task expectations in this context refers to one's beliefs about their personal ability to complete a task, their perceptions of task difficulty, and the perceived cost of a given action. Value, in contrast, is defined as the perceived reward, utility, and satisfaction derived from a given activity. Drawing largely from the work of contemporaries like Skinner and Hull, Atkinson adopted a primarily externally focused model of understanding motivation. He posited that that it was through a lifetime of conditioning that individuals ultimately shaped their perception of expectancies and values and that through understanding one's background you could then predict behaviors based on this model. Before long however, EVT adapted to reflect the rising body of literature in the field of motivation studies.



By the 1980's expectancy value theory was given new life in the works of Jacquelynne Eccles. Setting out to conduct a multi-year longitudinal study examining achievement differences across gender in high-school students, her work re-articulated and expanded upon the original theoretical basis of EVT (Eccles, 1984). The result of her work is often thought of as the modern incarnation of Expectancy-Value Theory as it is known today. Much like the original theory, Eccles' Expectancy-Value maintains that individual actions and behaviors were the byproduct of a constant evaluation of expectancy and value variables. Unlike her predecessors however, Eccles' (Eccles & Wigfield, 2000) model went a step further in noting that

Expectations and values, as they relate to school performance, are determined by such variables as the individual's goals, self-concepts, perceptions of parents' and teachers' expectations, their interpretations of reasons for past performance, and their perception of the difficulty of the (p. 12).

Demonstrating a view heavily influenced by Social-Cognitive Theory, this rendition illustrates achievement behavior as a culmination of both experiences and socialized beliefs that ultimately shape an individual's expectancy and value beliefs and dictate their motivational behaviors. Although her study was unable to find significant differences between genders as intended, she was able to support Atkinson's original model by demonstrating strong correlations between student expectancies and constructs of value relative to class achievement outcomes (Eccles, 1984). More recently, Eccles

and Wigfield have continued their research in EVT and integrate new ideas into the model.

Relatively few studies have attempted to examine online learning behaviors within a framework of Expectancy-Value Theory. While some studies give mention to it in their background on motivational literature (Hodges, 200; Miltadou and Sevenye, 2013) few have actually used it as primary framework for analysis. Despite having been under-studied in relation to online learning, the scant literature available does seem to suggest this theoretical model's potential significance. In one study, utilizing SEM analysis on over 260 respondents, researchers concluded that, "results indicate that performance expectancy, effort expectancy, computer self-efficacy, attainment value, utility value, and intrinsic value were significant predictors of individuals' intentions to continue using Web-based learning" (Chiu & Wang, 2008, p. 2). Findings such as this, paired with the frequent debates about online learning in relation to credentialing (Bonvillian & Singer, 2013; Allen & Seamen, 2013), lifelong learners (Wilson, 2007; Ry, 2014; Yuan & Powel, 2013), and supplemental uses (Liyaganawardena, 2013, Fox, 2013), all point to potential importance of EVT in understanding participant behaviors within MOOCs.

### **3.1 Research Methods**

This research consisted of a series of individual semi-structured interviews aimed at providing an initial exploratory qualitative analysis of the factors that impact student motivation, participation, and achievement in Massive Online Open Courses (MOOCs). A total of eight interviews were conducted with research participants who were activity enrolled in a MOOC or who had taken part in some portion of a course within the last 3 years. For the sake of this study, MOOC courses were defined as any online instructional programs that meet the following characteristics: open and uncapped enrollment, provide multiple forms of related content or exercises in a sequential manner, and provided some form of feedback or tracking to students. Completion was defined in two ways. The first definition is common usage and refers to the more structured programs with clearly outlined course goals, timelines, and start/end points. The second definition of completion refers to those programs in which no clear start/end dates or minimal guidelines/direction were provided. In these contexts, completion was defined as the point in which a student felt they had completed their desired outcome by finishing a series of skillsets or videos up to a logical dividing point. In Khan Academy Math, for example, a student might not complete the entirety of the skillsets/lessons offered on the program, but instead, may complete 20 skills that constitute the “Basic Geometry” set and stop because their immediate needs or purpose was met. In this case, this would be deemed as completion within the context of this study. This dual definition will be discussed to a greater extent in the findings and discussion sections.

Semi-structured interviews lasted approximately one hour and followed a general-to-specific format in their line of questioning. For each topic, participants were provided a general open-ended question, such as “can you tell me about the class format and what you thought about it?” They were then allowed the opportunity to respond unguided in order to address topics and factors they deemed most important. Follow-up questions were then asked to seek additional information pertaining to any key concepts in motivational theory or course structural dynamics that had not been addressed in their initial response (i.e. elements of autonomy support, dynamics of classroom interactions, etc.). Questions were focused on both an observational and personal experiential level. At the observational level, participants were asked to describe their programs, their interactions, their own behaviors, and their program outcomes. These questions were geared at understanding the average student experience within MOOCs and examining common trends relating to structure, participation, and program outcomes. At a more personal level, participants were then asked about their motivations, their perceptions or sentiments regarding the general observations noted, and their beliefs about program strengths/weakness or the reason for their program outcomes. These questions were based around the motivational literature reviewed and sought to explore concepts of student self-efficacy, relatedness, autonomy, goal orientations, outcome attributions, constructs of value and more.

After the interview, findings were collected and organized for cluster and trend analysis looking for reoccurring response themes, outcome correlations, or potential areas in need of additional review. These findings were then reviewed in relation to

predominate research literature in the fields of motivation studies, online education, and MOOCs, in order to examine the ways in which this study's findings match or contradict those of prior research. Participation in this study was done on a confidential basis and all names provided in this paper are pseudonyms

### **3.2 Study Participants**

All study participants were selected on a volunteer basis and informed of the study through a combination of convenience and snowball sampling originating within the researchers immediate social and professional networks. Study participants were required to have taken part in qualifying MOOC for a minimum of two weeks within the last three years. These specifications were intended to refine the sample to those who had extended their use of MOOC past simple exploratory dabbling and to ensure that the experiences discussed reflected MOOCs in a more recent state rather than their earliest incarnations. Despite efforts to diversify the sample group, participant demographics primarily consisted of individuals ranging in age from 19-31 who were either actively enrolled in university education or had graduated within the last 5 years. All participants lived in or near the Southern California region and the majority of participants came from math or science backgrounds. The following chart provides a brief breakdown of the participants and their programs of participation.

Table 1: Overview of Participant Demographics

Participant Pseudonym	Age	Gender	Education Status	Field	MOOC Program	Reported Uses
Lucas	31	M	Masters Student	Bio/Zoology	Ed-X, Coursera, Khan Academy	Supplemental, Stand-Alone
Colin	28	M	Pre-Med Student	Bio/Pre-Med	Khan Academy	Supplemental
Amy	23	F	Bachelors Student	Chemistry	Ed-X, Khan Academy	Supplemental, Stand-Alone
Nick	27	M	Masters Student	History	Ed-X, Udacity, Khan Academy	Supplemental, Stand-Alone
Jennifer	19	F	Bachelors Student	Sociology	Coursera, Khan Academy	Supplemental, Stand-Alone
James	25	M	Graduate (BA)	Engineering	Code Academy, Khan Academy	Stand-Alone
Katrina	27	F	Pre-Med Student	Bio/Pre-Med	Coursera, Khan Academy	Supplemental
John	29	M	Graduate (BA)	Bio/Nursing	Khan Academy, DuoLingo	Supplemental, Stand-Alone

#### 4.0 Findings

Despite its limited scope and scale, this study did manage to identify several interesting trends throughout the research. These findings essentially take two forms: those focused student’s general observations/experiences within the programs and those relating to the motivational constructs outlined in the selected literature. In regards to the program observations, this study’s findings support the claims of typographic ambiguity and challenge the simple cMOOC/cMOOC classification commonly used. Findings also indicate the potential significance of “supplemental learners” in understanding online learning behaviors and explore other minor patterns identified. In the second set of findings, participant statements about utility, feedback, community, and autonomy are

explored and examined in relation to program outcomes and participation patterns. These findings indicate the importance of utility value and feedback, as well as, explore the use of the various motivational models in interpreting student behaviors and outcomes. It is important to reiterate however that, given the cursory nature of this work, all findings presented here are preliminary observations intended only to help narrow and refine future research efforts.

#### **4.1 Typographic Confusion**

The first finding of this study reiterates the commonly observed issues of typographic classification frequently noted in literature pertaining to OE and MOOCs. Both researcher and participants alike struggled with typographic ambiguity in attempting to define MOOC's and the concept of completion. The following participant's statement illustrates this pattern.

I mostly used it (Khan Academy) to reinforce things we had gone over in my other classes, or sometimes just to learn about topics I found interesting. I wouldn't really say it's a course though – more like a tool. I don't think I ever really finished a series of videos. I just sort of bounced around as needed or to whatever interested me.

John (Participant in Kahn Academy, Duolingo)

While some students' descriptions of courses matched the xMOOC/cMOOC classifications that are prominent in research literature, three programs (Khan Academy, Duolingo, and Code Academy) did not neatly fit either of these models. In these cases, peer/instructor interaction was typically minimal or non-existent and the programs were

not formatted like a traditional classes with a clear start/end point or timeline. Instead, achievement was observed through the completion of single skill sets or topic sets with no overarching grade. Rather than completing a course in algebra, students might complete any number of skills within algebra, such as “graphing systems of equations”. Students could skip or repeat these mini-lessons as they saw fit and had no overall timeline or grade. Upon completing a series of videos or exercises, tasks were marked as complete. Optional, intermittent, testing would then review completed tasks/topics and adjust them to either remain complete or shift back to incomplete status as deemed necessary. As illustrated by the following quote, many students use of these programs bore little difference to the act of simply finding videos on YouTube or similar websites.

I don't think I would call it a course per se. There was no debt lines and no assignments - It didn't really seem like one (a course) at all. I mean...I guess there was forums people could use to discuss things, and some topics even had exercises, but I never really did any of that. I mostly just watched the videos.

Colin (Khan Academy Participant)

Ultimately however, given that these types of courses grouped videos into subjects and subtopics, provided some form of tracking or exercise mechanisms, and included optional means for interaction with peers or instructors, they were recognized as MOOCs within the context of this study.

Even when courses did match the xMOOC/cMOOC classifications, practices varied significantly both across and within MOOC providers. When asked about interactions and feedback, one participant stated:

All the classes I took were very different in that regard. Even though I took most of them through Coursera and Ed-X , it (classroom practices) always depended a



lot on who was teaching it. Some gave feedback, others just marked it complete or incomplete. Some had active discussions and participation requirements, others didn't. The one class I actually completed was pretty different in that regard. It was an Ed-X Course where your work would get sent to other students and your grade would be the average of the grades they assigned you. You also had to grade others in order to get completion points for assignments. That only made up a small portion of the course however and for the most part the class was similar to the others (xMOOCS).

Lucas (Participant of Ed-X, Coursera, and Khan Academy)

This statements shows how variations in individual teacher practices can yield very different student sentiments and experiences. Even within the classification of an xMOOC, a great deal of variation seems to persist. Many classes did not appear to be strictly xMOOC or cMOOC and reportedly blended practices from both models in some instances. Even several of the automated courses, such as Duolingo and Code Academy, integrated a diversity of approaches by providing a cMOOC like peer grading/interaction resource as an option to students.

Moreover, based on participant statements, MOOC providers did not appear to limit themselves to one classification. Both xMOOCs and cMOOCs can be offered by the same provider. This may further complicate efforts to develop a simple identification and classification system within the field. Ultimately, these findings suggest that classifications are not as rigidly defined as the binary system of xMOOC/cMOOC commonly discussed. Instead, many courses appeared to be conducted in more of grey area between the two models. Moreover, given the unique nature of Khan Academy, Duolingo, and Code Academy, this research's findings may indicate that MOOCs may have developed past the two common categories and could potentially benefit from further subdivisions in future analysis.

## 4.2 Perceptions of Utility

Another key findings of this study was that, in the case of the participants surveyed, utility value seemed to be the best indicator of prolonged engagement or course completion. While intrinsic motivation or interest were commonly brought up by participants during interviews, it did not seem to correlate with course completion or prolonged participation. All study participants stated that they had taken a MOOC to pursue topics of interests or for their own personal development at some point. Of these, all stated that they enjoyed the topics selected and most (7/8) demonstrated strong self-efficacy beliefs by stating that they felt confident in their abilities with the topic at hand. Despite their ambitions and reported self-efficacy however, only three reported actually completing a course. In all three of these instances, the utility of the course was cited in interviews as having been a primary factor that contributed to their achievement outcomes. When asked about one of the few courses he completed, one participant stated:

I really wanted to complete that course – I thought it would help with skills and provide something for my resume. I was trying to get into a field that required regular use of scientific notation and figured this class could help twofold: it would give me a little more practice using it (scientific notation) and would serve as something to demonstrate my skills on paper. I don't really think anyone would take a Ed-X degree all that seriously, but for such a specific technical skill, it seems as good as any for a documented certification.

Lucas (Participant in Ed-X, Coursera, and Khan Academy)

Similarly, when asked about their reasons for completion, another stated:

I completed up to the intermediate section in it (Duolingo Spanish course). I really like Spanish and enjoyed the topic but it was actually because I needed it for work

that I kept going. In San Diego, you are pretty much guaranteed a job as a paramedic if you are bilingual and have an EMT certification.

John (Participant in Duolingo and Khan Academy)

While the two quotes above emphasize the work utility of the courses taken, another statement demonstrated academic utility.

I got furthest on the math program. I completed something like 160 skills in that. It wasn't that it was particularly interesting or anything. I actually don't even like math that much. I just knew it would help with the GRE so I kept at it. I could have kept going too, but I figured I had completed enough skills for the test.

Nick (Participant in Khan Academy, Coursera, and Ed-X)

In contrast to these statements, those who did not complete courses tended to stress the high costs of participation relative to the perceived minimal value/utility. When asked about her reasons for quitting a course, one aspiring bio-chemist stated:

I was really interested in the topic (bioethics) and knew it would eventually help me when I have to take that class later on, but I was surprised by the workload. It was actually more demanding than many of the biology classes at my university. I kept up for several weeks but eventually needed to focus my time on my real classes. I am sure it would have been helpful and interesting, but it just didn't seem to be worth the amount of effort at that point in time. Maybe I'll take it again when I am actually taking that class (at the university) later on.

Amy (Participant in Coursera and Khan Academy)

Another reiterated this point by stating:

Many of the courses are just too demanding. Between the lectures, readings, assignments, and tests, it ends up being a whole lot of work for very little payoff. I mean I could have paid to have taken the class for a certificate but I didn't really see a point. I wouldn't have put it on my resume.

Jennifer (Participant in Coursera and Khan Academy)

Even when courses did not require extensive effort, other factors could contribute to the student's perceived participation costs. When asked about a particular Ed-X course that a study participant had withdrawn from, he stated:

The class structure was fine and I actually enjoyed the topic but the professor was just soooo boring. Eventually, since there was really nothing on the line, I just decided it wasn't worth watching the videos anymore and stopped attending.

Lucas (Participant in Ed-X, Coursera, and Khan Academy)

In this example, minimal investment and a lack of perceived value were compared to the perceived higher costs of a "boring" instructor and resulted in the student's disenrollment from the class. Even in instances where the perceived cost was not stated as an issue, several students indicated that they had discontinued programs once they felt they had achieved whatever utility they originally saw in it.

I was struggling - I mean really struggling - in my organic chemistry course. The teacher just assumed we already had a lot of prior knowledge that I was unfamiliar with. I really couldn't afford to lose that class though so I used Khan Academy to review some of the basics from prior courses. I already knew a lot of what they covered though so I only skimmed bits and pieces. Eventually, I stopped using it (Khan Academy) almost altogether once I felt I had caught up enough.

Colin (Participant in Khan Academy)

In fact, all of the participants who stated that they had used MOOCs to supplement their university classes, expressed this pattern of intermittent use. None of them expressed any intent or desire to have completed the entirety of the MOOC courses in which they had been attending.

All of these statements support an underlying theme. Students that stated that they saw a high utility value in the MOOCs they were attending were more likely to complete the programs. Students who initiated courses out of interest or general inquiry however, were typically quick to disenrollment. No interview participants who stated they took a course out of general interest alone completed their course or even made it past the first few weeks. The one exception to this link between value and achievement pattern was seen in those students who had used MOOCs to supplement courses they were attending in their primary education. In these cases, although the students saw a higher utility value in the course, their engagement patterns reflected their intentions and none completed nor intended to complete the MOOC courses they participated in.

### **4.3 Perceptions of Feedback**

While most literature on online learning stresses the important of instructor feedback, this study seemed to instead support the value of feedback in general. Those who stated that they had completed, or at least made it relatively far into study, almost always made mention of some form of feedback. Moreover, at least two participants referenced a lack of feedback as a factor in their program withdrawal. One such student stated:

I tried really hard in the first assignment or two, but at some point I just stopped seeing the point in doing them. You would be required to write a paper but would just get points for turning it in. It didn't matter if you were wrong, right, or whatever - It was just points for entry. I think that was the first step of me eventually quitting the class altogether.

Amy (Participant in Coursera and Khan Academy)

When asked about the subject however, those students who did complete courses (or at least got further along), commonly stressed the value of feedback.

It (peer feedback) was a neat way to run the course. You got real input on your works and, by grading others, it actually helped to review what you had covered. Sometimes I got marked for things I didn't agree with, but that happens in normal classes too so it wasn't all that different. I think it made me try harder knowing that other students would be judging my works.

Lucas (Participant in Ed-X, Coursera, and Khan Academy)

Interestingly, the few mentions of instructor feedback were relatively neutral and the students did not seem to indicate it as being either immensely influential or expected in most cases. Instead the majority of participants commonly expressed a view that instructor feedback was "helpful but limited" or available but never utilized. The students that spoke most highly of the value of feedback usually stressed peer feedback or automated tracking systems.

You never really got feedback from the instructor or other students or anything like that, but it (Khan Academy Math Course) did have ways of letting you know how you were doing. It was actually a very well thought out system. You would complete a skill activity, then later have to show your ability on a test. Tests would mostly include new skills that you had completed but sometimes would include things you have already mastered or haven't seen yet. Every skill had a tiered level of mastery that dictated how often it appeared on tests. The lower the tier, the more frequent you were tested on a topic. If you got something wrong, it would drop you a tier on the exercise for that skill and you would have to complete a shorter version of the skill training you had already done and retest to move up again. It really helped to track your progress and to direct your efforts or let you know how you were doing.

Nick (Participant of Khan Academy, Coursera, and Ed-X)

In fact, of the three participants who reported completing a course, all three mentioned feedback of some sort as being significant to their motivation and engagement. In most cases however, MOOC participants involved in this study did not feel that any significant feedback was provided, but tended to state that little feedback had been anticipated from the onset. Illustrating this reoccurring mentality one student stated:

There was no feedback apart from credit no credit but I didn't really expect there to be. In a class that big, how could a teacher really provide much (feedback)?

Jennifer (Participant in Coursera and Khan Academy)

While it seems most participants had little expectations in regards to course feedback, those who did received it, tended to reference it as an important factor for their course completion or continued participation. Moreover, students did not seem to place significant importance on the source of the feedback. Rather from the instructor, other students, or even automated systems, feedback was generally viewed as being of high value as long as it was dynamic in nature and extended beyond simple credit no credit systems.

#### **4.4 Perceptions of Community/Interaction**

Despite the wealth of effort that has gone into improving student interaction and communication in online learning environments, no interview participants mentioned messaging boards, forums, or chat rooms as having been significant to their academic progress. All programs taken by participants seemed to offer some forum or alternate means of community interaction. In almost every case however, participants viewed these as being “interesting” but largely irrelevant. Discussions were commonly thought to be disjointed, unimportant, or limited to a very few students in regards to participation.

Illustrating this point one participant stated:

There was an online forum but very few people seemed to use it. It was helpful that you could post a question or comment there, but I never really had to. I looked through it from time to time but never posted anything myself. The only time I actually used it was to read the responses to a question someone had posted that was similar to mine.

Amy (Participant in Coursera and Khan Academy)

Another student lamented about the quality of dialogue in MOOCs stating:

The chat board seemed more off topic then useful. There were several people who just complained and a few random side discussions that only loosely tied to the topic. But not everyone used it that way- there were a few questions and what not - but for the most part, it was more like gossiping in the back of class than a formal discussion.

Katrina (Participant in Khan Academy and Coursera)



While participants of cMOOC format courses did talk about their experiences in peer grading/interaction, they tended to emphasize the value of feedback over the value of community interaction.

Students interacted through grading each other's works but that was about it. There were ways we could carry on discussions or chat but very few people seemed to use them. Personally, my interaction with the other students was limited to grading and being graded.

James (Participant in Code Academy and Khan Academy)

Ultimately, it seems that despite being a core element of most programs, communication resources are underutilized and commonly seen as being insignificant or irrelevant by interview participants. One student did state that his course required regular posting and seemed to have a vibrant discussion board, but had little more to comment on this due to his early withdrawal from the program for other reasons. Within this limited sample, it appears there was little significant active learning communities present but that this did not seem to be a major concern for the majority of interview participants. Moreover, in discussing friends or families use of similar programs, it did not appear that any participants were part of MOOC learning communities outside of the class. While one or two mentioned that they had friends who had used similar programs, none felt this was a significant contributing factor to their participation in the programs nor stressed any peer support or encouragement as being influential in their engagement behaviors.

#### **4.5 Perceptions of Autonomy**

An unsurprisingly abundant topic of discussion was the idea of student autonomy. In every interview, students spoke to the advantages of working on your own timeframe and being able to re-review or skip lessons portions as needed or desired. In one of many examples of this, a student stated:

It was nice being able to do things on my own schedule. I could pick when to watch the video and when to do the assignment, and even what parts of videos to watch. Sometimes I would watch a single part a few times over if I missed something, other times I would skip entire sets of videos I felt were too simple.

Colin (Participant in Khan Academy)

Most interview participants shared this view of having a great deal of autonomy in setting their own class schedule. This autonomy was not always viewed as being advantageous however. Several students stressed time management struggles or the tendency towards procrastination as an issue within contexts of such flexibility. One student who withdrew from a Coursera course after just three weeks stated:

It was nice being able to do things on my own schedule, but without the pressure of a debt line, I ended up postponing the required tasks until they had stacked up so much that it just seemed like too much effort to catch up. I think it would work well for some people but I personally need a little for pressure or accountability to get things done I think.

Jennifer (Participant in Coursera and Khan Academy)

While many interview participants shared this mentality of struggling with procrastination, most did not view it as a major barrier. Instead, most interview participants stated that they generally considered themselves as being “good at self-management” but noted that this was a possible concern for “other people” who may take the courses.

Lastly, in regards to student autonomy support, no student stated a sense of having control over topics or assignments within a set course. While the ability to skip or repeat videos allowed some control of the order and selection of topics, they were always within a set series and offered no options in regards to writing or exercise assignments. One student illustrated this by stating

You had a lot of control over your schedule but not really over which tasks to complete or writing topics. I mean, I guess you do have control over that in your selection of which class to take but not so much once you were in the class. In my real classes, you might have several options of writing topics. In the coursera course I took however, you were always told exactly what to write about. I would say it was sort of a give and take.

Katrina (Participant in Coursera and Khan Academy)

Despite the participant’s tendency to emphasize and praise the atmosphere of autonomy in MOOC programs, no clear link between autonomy support and engagement or achievement behaviors was observed within this study’s sample group. It may be worth noting however that Khan Academy, the program with the least requirements and control

in regards to student participation and interaction, was by far the most commonly used and well known of all MOOC discussed within this study.

#### **4.6 Supplemental Uses**

As briefly mentioned prior, another reoccurring trend in the interview discussions was the use of MOOCs as a resource to supplement the participant's primary education. From reviewing basic algebra in preparation for the GRE, to striving to understand the nuances of the gastro intestinal processes as part of a requirement for a nursing program, almost every interview participant (7/8) talked about using MOOCs to help them in their primary educational goals. In one particularly poignant example of this, an interview participant stated:

Pre-med programs are very difficult and competitive. To make matters worse, my physiology teacher spoke broken English and was not very approachable. I think Khan Academy was the only reason I did so well. Every day, I would go home and watch video related to whatever we had covered in class. Even commuting to and from school I would listen to them in the car. While my classmates were all struggling and complaining about the teacher, I was getting an A on every test. I really do believe that Khan Academy is one of the main reasons that I have been able to continue my career in medicine.

John (Participant in Khan Academy and Duolingo)

Furthermore, as illustrated in the prior discussion about utility value, students who primarily viewed MOOC as supplemental resources typically demonstrated different engagement patterns and goals which heavily influenced achievement outcomes. When asked about program completion, one research participant specified:

I used it (Khan Academy) to help cover topics we covered in class. I didn't do all the exercises or even watch all the videos through. That wasn't really my plan

from the start. I just used it to brush up on the things when I needed to. In truth, I think I skipped like 80% of the actual content.

Katrina (Participant in Coursera and Khan Academy)

In fact, none of the students who reported using MOOC primarily as a means to supplement other courses stated that they completed a MOOC in its entirety. Instead, many programs were typically used more like Personal Learning Environment (PLE) resources rather than standalone courses. Students would reportedly pick and choose whatever elements they saw most beneficial while often striving to minimize participation costs in regards to time or effort.

#### **4.7 Other Findings**

Among the other observations worth noting here are: the lack of expressed technological barriers, the mixed feeling regarding the formality of structure in xMOOC courses, and the prominence of Khan Academy in regards to use and general awareness.

Although technological competency is a common concern noted in literature in online learning (kop, 2011), no interview participants expressed any issues in that regard.

Interfaces were generally considered easy to understand and navigate. One student demonstrates this by stating:

It was really easy to use. I mean, it was just a website and a forum. Growing up using chat rooms, Facebook, and websites, it was all pretty intuitive. I think the online class interface my college uses to upload syllabus and readings is actually more confusing.

Lucas (Participant in Ed-X, Coursera, and Khan Academy)

Another reoccurring theme was the mixed feeling regarding the perceived formality of xMOOC class format. Frequently students stated that the similarities between the xMOOC model courses and traditional class formats added to its perceived legitimacy but also simultaneously added to its difficulty. In a particularly insightful view, a participant commented:

I sort of liked that it was done like a real class, with hour long lecture released every week and real debt lines for assignments and tests. It made it feel much more legitimate than some of others (MOOCs) I have seen. On the other hand though, that was also part of why I dropped out. While it made it seem more official, it meant higher demands. It's like they just superimposed the normal classroom approach but lost a few important parts along the way. Sure it's more official feeling, but that means it's harder and the end results don't really have the same value as a real college class would.

Amy (Participant in Coursera and Khan Academy)

In total, 3 participants expressed a similar mentality; portraying a balance between the perceptions of greater legitimacy and the difficulty of stricter workloads and timelines. In all of these instances, students drew parallels between xMOOC and standard face-to-face classes but typically pointed to comparatively lessened interaction, support, or outcome values in the xMOOC context.

A final notable finding was the abundant use and recognition of Khan Academy. Only one participant was familiar with the term MOOC in general. While all had taken part in MOOC programs, most were unaware that the courses they had participated in were part of a broader genre. While some knew of one or two programs similar to that which they had taken, most possessed a limited awareness of MOOCs or of alternate

MOOC providers. Khan Academy however, seemed to be commonly recognized. All study participants were not only aware of Khan Academy, but had utilized the site in varying capacities. To put this in context, the next most recognized program was Ed-x, of which only 3 out of 8 participants were familiar with or had used the program. The reasons for Kahn Academy's prevalence was beyond the scope of interview questions, but is an interesting topic for discussion in the later portion of this paper. The following graphs outlines the MOOC addressed in interviews and some general details about the course model, attendance/completions, and student uses.

Table 2 – List of MOOCs, Participant Uses, & Reported Outcomes

<b>Provider</b>	<b>Primary Model</b>	<b># of Study Participants</b>	<b># of Completions</b>	<b>Primary Uses Reported</b>
Ed-X	xMOOC/cMOOC	3	1	Supplemental Stand-Alone
Coursera	xMOOC/cMOOC	2	0	Supplemental Stand-Alone
Khan Academy	pMOOC*	8	1*	Supplemental Stand-Alone
Duolingo	pMOOC*/cMOOC	1	1*	Stand-Alone
Code Academy	pMOOC*/cMOOC	1	0	Stand-Alone
Udacity	xMOOC	1	0	Stand-Alone

## **5.0 Discussion of Student Experiences/Observations**

### **5.1 Proposal of “pMOOC” Model**

As discussed in findings, classification was a significant barrier to this and similar research projects. MOOCs often do not neatly fit into the xMOOC/cMOOC classifications prevalent in research literature and provider/educator practices can vary drastically both within and in-between programs. Moreover, in the case of several programs discussed, traditional definitions of completion are hard to map onto program outcomes. While xMOOCs, cMOOCs, and traditional online courses all share the characteristics of a clear start/end point with distinct learning outcomes, programs such as Khan Academy, Duolingo, and Code Academy are less clearly defined. Within these programs, massive amounts of information are typically divided in finite skills which are readily available from the very onset of the program. No overarching grade or cumulative scoring is provided apart from the tracking of progress. This method complicates traditional conceptions of course completion.

Completion in these courses was generally viewed by participants as the state of having completed a body of related skills to an extent that the participant felt they had reached their desired learning objectives within the program. This means that, two of the



three program completions discussed in this research can only loosely be defined as a completion in the traditional sense. John, a student in Duolingo's language program, completed all skill sets up to an intermediate level. Similarly, Nick, a student in Khan Academy's math program, completed over a hundred skillsets in math, up to the point to trigonometry. While neither participant completed the entirety of skills offered within MOOCs they had participated in, both completed a series up to a logical dividing point and felt they had achieved their desired outcomes in utilizing the programs. All other study participants also stated they had utilized these programs to some extent, but most had bounced about skillsets or stopped participating in the programs at arbitrary points that were unrelated to their desired outcomes.

Other researchers have also struggled in placing these unique formats within the context of a MOOC genre. While some have placed them alongside other MOOCs with little-to-no mention of their unique characteristics (Yuan & Powell, 2013), others have been more cautious in acknowledging their unique position within the typography of MOOCs. George Siemens (2013), for example, has recently given further attention to these unique programs calling them "quasi-MOOC" and contending that they can only loosely be defined within the genre. Based on his interpretations these quasi-MOOC are:

[T]echnically not courses. They consist of OER (Open Educational Resources) intended to support learning-specific tasks such as an operation in algebra, or they are treated as asynchronous learning resources that do not offer the social interaction of cMOOCs or the automated grading and tutorial-driven format of xMOOC (Siemens, 2013).

The data from this study's research however, challenges this classification of these programs as being non-courses or "quasi-MOOCs". While many students did in fact use these programs in less formal ways, a small minority of participants describe a much more structured experience. Those who "opted in" to being active participants in these program, tended describe them as coherent and comprehensive instructional programs. These programs contained set series of information groupings with integrated social interfaces and an automated graded and feedback mechanisms. In light of this, this research would propose that, rather than viewing such programs as a "quasi-MOOCs", they may be more beneficially understood as combination of Personal Learning Environment (PLE) resources paired with traditional MOOC organizational structures. Students can either passively pick at content or programs, or can actively combine integrated resources to create comprehensive courses. Thus, this researcher proposes that this model could be more adequately described by the introduction of the concept of a PLE MOOC, or "pMOOC" for short.

These "pMOOCs" adopt most of the characteristics of a MOOC laid out by Cormier (2010). They are typically massive, open, free programs with no restrictions or formal accreditations. They differ however, in the level of control over the learning process that is allocated to the student. These programs consist primarily of compilations of Open Educational Resources (OER) paired with an organization infrastructure, social interfacing tools, and tracking and grading mechanisms. They have far less restrictions on the ways in which resources are to be used or in what order or fashion participants may opt to use them. In this regard, they may be an incarnation of MOOCs that follow

Antonio Fini's (2009) suggestion of developing programs that allow student greater opportunities and freedoms in selecting tools and interfaces that best fit their individual needs and interests. While the bulk MOOC research literature available tends to compare teacher-to-student knowledge transmission to student-to-student knowledge building (Siemens, 2013; Bonvillian & Singer, 2013; Yuan & Powell, 2013) the broader field of research on online education has long recognized the existence of Student-to-interface model of learning. This proposed "pMOOC" model may simply be the application of such student-to-interface models within the context of a MOOC.

## **5.2 Supplemental Learners**

This research also demonstrated that a large number of study participants used MOOCs, particularly "pMOOCs", to supplement their primary educational courses or goals. Furthermore, findings indicate that these supplemental uses may have impacted the students' engagement and achievement behaviors within MOOCs. Despite having been a prevalent theme in this study, the concept of supplemental uses is surprisingly limited in the literature on MOOCs. One potential reason for this is a gap in research surrounding participants who withdraw from MOOC programs (Kop, 2011). While a few researchers have noted supplemental uses in passing (Bonvillian & Singer, 2013), they have rarely been a focus of research. Instead dominant narratives in the field often discuss participation behaviors in terms of "Active, Passive and Lurker" (Milligan et al., 2013). Other studies, focused specifically on student motivation, have also often overlooked

these supplemental uses. In Belanger and Thortan's (2013) research for instance, they identify lifelong learning, intrinsic enjoyment, convenience, and exploration as the primary motivators for student participation in MOOCs. They make no mention of those who seek to use MOOCs to bolster their primary academic progress.

This lack of supplemental learner identification in the literature may have many explanations. As mentioned above, most literature on the topic has been focused on participants who are actively attending or have completed MOOC programs (Kop, 2011). A gap in the literature can be found surrounding the views and perceptions of those who withdraw from MOOCs or do not complete the majority of tasks. Secondly, many studies have emphasized adult, recreational, lifelong learners as the primary participants of MOOC programs and have thus focused on these groups (Allen & Seaman, 2013). Regardless the reason, this study's findings seem to indicate that the supplemental uses of MOOCs are a significant consideration in understanding engagement and achievement behaviors that should be researched further. This group embodies the arguments of MOOC advocates like Sanjay Sarma (as cited Bagely, 2013) and George Siemens (2013) who contend that completion rates do not reflect MOOC value or quality and instead are indicative of the nature of student uses and intentions in enrolling within such programs.

### **5.3 Prevalence of Khan Academy**

Another interesting topic for exploration and discussion is the prevalence of Khan Academy. Based on the findings of this study, utility seemed to have been the greatest

indicator of continued participation and achievement for interview participants.

Furthermore, as also cited by this and similar research, autonomy is generally hailed by students as being a favorable characteristic and noble pursuit but is often considered to be overshadowed in the perceived importance by other factors (Fini, 2009; kop, 2011).

While students seem to almost unanimously recognize and address the level of autonomy support in MOOCs, the benefit of such practices are perceived as a mixed bag. Despite seeing the value of autonomy support, factors such as program support and feedback are typically considered more important to student learning and achievement outcomes.

Given these findings on utility and autonomy then, it is unusual that Khan Academy was the most used, and often most highly praised, of the programs discussed in this study.

This program is one of the least recognized in regards to accreditation or certifications. It is not hosted or sponsored by any formal university or known educational entity and it does not offer any potential for units or certification. Instead, it is a program hosted primarily out of one informed individual's efforts in response to an outpouring of support received after he posted a series of instructional videos on YouTube. Moreover, its primary focus seems to be on student autonomy with many sections providing little-to-no options for interaction or feedback. Given this information, why then is this program so widely recognized and used?

The reasons for this likely span well beyond the scope of this research. That said, several variables can be tentatively identified here for use in future research and analysis. The first of these potential causes is the nature of this research and its limitations. Given this studies limited scope and scale, it is possible that these findings are more

representative of the context rather than of any broader theme of MOOCs. Despite efforts to diversify study sample, all participants were ultimately of a similar age range (19-30) and were either recently or currently enrolled students. As a result, it may be that Khan Academy is not in any way better known or more utilized than other MOOCs, but that it is a program that happens to be well-known or applicable within this study's particular demographic group. Having qualified this finding, it may still be beneficial to explore some alternative theories as well.

One such alternative explanation may be seen in the role of utility value. While the program may not offer formal certificates or other items of relative social or cultural capital, it does still hold value in its ability to convey information. Moreover, since this program follows the proposed "pMOOC" model described above, it allows a great deal of student control over the learning process and has very little perceived costs of participation. Students have nothing to lose from using this program as they see fit and leaving whenever they desire. This value-to-cost ratio may be a significant factor in understanding the prevalence of this program's use, as well as, its relatively high non-completion rate.

Another potential factor may be the actual pedagogical practices of the program or the perceived relatability of the instructor. As mentioned prior, Khan Academy, and most "pMOOCs", typically have minimal interpersonal interactions and don't generally require any social interaction on the part of their students. While almost all of them do offer a means or ability to communicate with other students or teachers/hosts, very few participants reported using these services in any significant capacity. That said, one of

most common themes in participant's statements regarding Khan Academy was about the charismatic nature of the speaker. Salman Khan, speaker and developer of the program, was often described as being an amusing and engaging instructor who does well to provide complex information in simple straightforward manner. This tendency for many to enjoy him as a speaker reportedly made it easier for many student to relate to course and content. While the idea that a charismatic instructor is important to learning outcomes is far from groundbreaking, it is a topic that is seldom discussed in research surrounding online learning and MOOCS.

Another factor related to the concept of pedagogical practices is the way in which information was divided and disseminated. Many students praised the programs use of 5-20 minute videos in place of the hour-plus long videos typical of Ed-X or Coursera. Again returning to the idea of participation costs, several interview participants expressed a view of being able to watch a topic with a clear sense of start and end without having to allocate large swaths of time or energy. This may have also helped bolster competency as many students reported watching some sections repeatedly before advancing to the next video in a series. Finally, one particularly insightful participant related this model of short interval learning to concepts of cognitive load and attention span. In this case, he stated that, when watching larger videos of Ed-X, he often felt overwhelmed the by the abundance of content and was only able to retain a portion of what was discussed. He then contrasted this to the short video formats of Khan Academy. He stated that he believed this approach allowed him to learn a topic or skill, than stop and take the time to absorb and consider the information before advancing. He also spoke of the role of

attention span, explaining his own tendency to start to “daze-off” or “space-out” in the hour long lectures; a tendency he did feel was as much of an issue with the shorter video formats.

Whatever the reasons, this study’s findings raise some interesting questions about this and similar “pMOOC” or “quasi-MOOC” formats. Given that this topic has only just begun to appear literature however, a great of research is still required to understand how such program impact student participation, learning, and achievement outcomes.

## **6.0 Discussion – Findings within Context of Motivational Literature**

The second level of analysis in this study focuses on examining the participant’s experiences in relation to the motivational models of Self-Determination Theory (SDT), Socio-Cognitive Theory (SCT), and Expectancy Value Theory (EVT). In all three cases, various elements of the theories were regularly identified and discussed by participants. Despite many stressing the perceived importance of the motivational factors identified however, only EVT seemed to provide a clear framework for understanding student participation, engagement, and achievement behaviors within the context of this study. Although the other models would likely have proven just as important in furthering our understanding of student participation behaviors, the data collected within this study proved insufficient to identify any clear patterns within the frameworks of SDT or SCT.



## **6.1 Self Determination Theory**

In attempting to review this study's findings in relation to a model of self-determination theory, this research yielded mixed results. Although participant comments frequently addressed the key tenants of the SDT model (autonomy, relatedness, and competency) in MOOCs, no clear patterns could be seen between these factors and student's behaviors.

Students frequently cited scheduling autonomy as a major factor contributing to their enjoyment and use of MOOCs. Despite these frequent statements however, no clear link was seen between autonomy support and program engagement or achievement outcomes. Similar to the findings of Kops (2011) study, MOOC autonomy practices were generally viewed as being a double edged sword. Scheduling autonomy was balanced by a relative lack of assignment and topic selection options within courses. Moreover, as discussed in findings, the lack of debt lines was often viewed as being both beneficial and detrimental depending on an individual student's metacognitive and self-regulatory behaviors. It is possible however, that such autonomy support practices did in fact increase program participation and use without leading to greater completion rates. This may partially explain why Khan Academy was both the most commonly used and least frequently completed program in this study. Counter intuitively however, the only study participant to actually complete a full structured course, that falls within general xMOOC/cMOOC format, was in a course that reportedly had greater restrictions in regards to debt lines and timeframe. While it is clear that MOOC participants commonly

recognize and discuss the high levels of autonomy within the various programs, the exact relationship between this autonomy support and student engagement remains unknown.

The concept of relatedness also seemed to have mixed relationship with learner behaviors. While most students in the study expressed that they had experienced minimal interaction with peers or instructors, the common consensus was that they did not feel such interactions were necessary. All the programs discussed reportedly offered resources and means for social interaction, but no study participants reported utilizing these resources to any significant extent outside of limited mandated contexts. This mirrors the findings' of kop (2011) and Milligan et al. (2013) in which active content creation was uncommon and most students were satisfied simply reviewing and interacting with existing content. In general, there was a shared mentality of low expectations in regards to course interaction and very little noted correlation between this and student satisfaction. Interestingly however, two of the three students who completed all or majority portions of their courses spoke of the role of peer interactions in aiding their continued participation. This may indicate that despite participant testimonies eschewing the importance of such interactions, it is actually a more important factor than most participants were self-aware of.

Competency, the third component of the SDT model, had a relatively minimal role within this research's study participants. While previous literature has stressed the importance of technological ability, language skills, and critical literacies in impacting student competency and self-efficacy beliefs (Fini, 2009; kop. 2011), most of these variables did not seem to pertain to this particular study's sample population. Despite the

body of literature stressing the link between technological competency and student performance and self-efficacy (Fini, 2009), none of the participants of this study felt they had experienced any such technological barriers. Instead, most referenced prior experiences with social media or formal educational institution's online interfaces as previous experiences using similar technologies. While this is likely another byproduct of the particular sample demographic that participated, it may also be telling of a general increase in technological awareness brought about by the inundation of online and computer technologies in education and daily life. Language barriers also did not prove a major barrier to the study participants. All participants were fluent in English. Even Lucas, an international exchange student, felt that what minimal language barriers he experienced were easily overcome through the ability to repeat videos as needed. In regards to subject competency, there was no clear pattern that could be seen in the data either. While all students reported feeling confident and capable within their areas of study, student outcomes varied significantly.

Where competency did seem to be a factor was in the notion of critical literacies and discussions of feedback. Students who did not consider themselves skilled at self-management often expressed difficulties with MOOC's. This supports Rita Kop's (2011) use of self-regulation as one of the primary literacies required for successful online learning. Moreover, in several instances, students spoke of how feedback impacted competency beliefs and shaped motivation and engagement. According to interview statements, progress tracking and feedback proved important to maintaining course participation. In contexts in which these elements were minimized or non-existent,

students often saw diminished value in their efforts and were more liable to withdraw or discontinue participation.

Ultimately, within the limited scope of this analysis it hard to derive any conclusive findings in regards to the motivational significance of the tenants of SDT within the contexts of MOOCs. It appears that, as indicated by prior research in the field, the motivational components involved are complex and multifaceted. This means that any research attempting to examine the impacts of the tenants of SDT must do so within a richly contextualized model capable of recognizing the ways in which classroom context, student predispositions, and any myriad of alternative variables impact and shape these constructs. Regardless these barriers, the fact that these topics were so frequently raised by study participants may speak to their potential importance. Perhaps, with greater care to dissect contextual and individual factors involved, research could better tease out the exact role that Self-Determination Theory's core components play in online learning environments

## **6.2 Socio-Cognitive Theory (SCT)**

Of the three models integrated into this studies efforts, SCT proved to be the most difficult to identify within the study findings. While many of the elements of SCT and its sub theories are likely of great significance in understanding online learning behaviors, the methods applied in this study were unable to effectively identify and relate these variables.

In regards to socialization of behaviors pertaining to MOOCs, no significant results could be identified. At a micro/internal scale, classroom communities were not generally perceived as having been important to student participation and learning behaviors. Although there was at least two instances of students reporting increased motivation as the result the social influences within their course (typically peer grading), most statements depicted isolated learning environments in which the other participants or instructors were seen as largely inconsequential. At a more macro/external level as well, social groups and peers outside of the courses did not seem to be major factors in shaping student participation behaviors. While students often stated they were aware of others within their social networks who had taken similar programs, none attributed their participation or perceptions to the experiences or feedback from their social networks. The vast majority of participants did however, perceive themselves as recreational learners and attributed their love for learning to family, friends, or various role models. This may indicate that while interest and participation in MOOCs themselves may not be socialized behavior, the tendency toward lifelong learning or the use of metacognitive strategies are. In this case, MOOC's just provide an easily accessed and affordable means to continue lifeline learning behaviors or receive additional resources and support.

In examining SCT model's sub-theories more specifically, it became clear that this study had inadequate means of assessing student goal orientations and outcome attributions to any significant depth. Given the voluntary nature of the programs, almost all of the participants attributed their inability to continue the program to their own choices. The only mention of a topic being "too difficult" was attributed to the student's

own self-identified procrastination behaviors, which had allowed content to build up. In most cases, participants attributed withdraw to outside time demands but felt that it was an issue of prioritization, not ability. Ultimately, further research is needed to understand how outcome attributions impact online learning environments. Similarly, this study was unable to identify links between goal orientations and achievement outcomes. Questions geared at identifying students' goal orientations, tended to yield relatively uninformative results. "It depends on the topic or class" was the common response of attempts to ascertain a student's typical goal orientation behaviors. Participants used MOOC both as a means to reach performance goals (i.e. supplementary uses to improve college class test scores) as well as mastery goals (i.e. lifelong learners taking courses out of general interest). Ultimately, it appears that the analyses of attribution and goal orientation could have been better served through the use of preliminary surveying or a more expansive and targeted line of questioning than that which was applied within this study.

Despite the failure of this study to adequately map SCT onto MOOCs, it is still the belief of this researcher that this may prove a very important model in understanding participant behaviors. Given that past research has linked self-regulation and perseverance behaviors to attribution and goal orientations, a greater understanding of their role may help shed light on MOOCs and their shockingly high attrition rates. It could be argued by some that given the abundant use of MOOCs by lifelong learners, the lack of formal recognition, and the minimal social interaction involved, these programs are inherently mastery oriented in nature. Based on this study's findings however, it appears many students use these programs to support their primary education objectives

and therefore could actually be using MOOC as a tool to fulfill performance goals within the broader context of their primary education. Ultimately, the ways in which goal orientations or student attributions impact online learner behaviors in MOOCs remains a gap in the research and literature. Developing a greater understanding of how such student predispositions impact learning behaviors, could potentially help shed light on student engagement patterns and aid efforts to improve programs in order to meet the needs of a broader range of learners.

### **6.3 Expectancy Value Theory**

Of the three models applied, EVT was by far the most salient model observed in participant commentaries. In almost every instance of withdrawal or discontinued participation, students cited perceptions of higher cost relative to low reward/value as a reason for their behaviors. As mentioned prior, the students that did manage to complete all or majority of a given program typically attributed some utility to it and thus saw greater value in the courses they attended. This may be an important concept in understanding the high attrition rates of MOOC programs, but without comparison to higher value program (i.e. those that offer credits), it is hard to fully ascertain what role value perceptions play. As mentioned prior, this model may also help shed light on the prevalence of Khan Academy despite it having the least formal affiliations and no certification. If students are not able to obtain units or valued credentials from programs, value is only derived in the form of knowledge acquisition. While all the programs

discussed offer opportunities for such knowledge acquisition, few do so with as minimal participation cost as the “pMOOC” formats. In these models, students had no timelines, strict testing, and were able to skip though irrelevant or uninteresting content as desired. In this regard, there was minimal cost relative to the gain of desired information. Moreover, the ease of selective access makes these programs more easily used as supplemental resource alongside unaffiliated live courses. While classes on Ed-x or Coursera may also mirror live class subjects, their content is not typically released all at once and students must wait for a topic to come up in the order of the course. In Khan Academy or Duolingo, in contrast, the full breadth of lessons and information is available from the very onset. This may be why the program that boasted the least in regards to formal value (credential/units), was the most commonly used and recognized.

Overall, while students demonstrated a diversity of reasons for their perceptions of value or costs, such concepts were almost unanimously cited as a main reasons for program participation behaviors. In light of this, it is suggested that future research seek to compare participation and engagement behavior between non-credentialed MOOCs, to the rising body of MOOC offering units, certifications, or alternative forms of value to their students. Only through such a comparative model could research begin dissect what role value plays in explaining student learning patterns and the high attrition rates of MOOCs.



## **7.0 Limitations and Suggestions for Future research**

As stressed from the very onset of this study, this research is intended only as a preliminary exploratory analysis intended to help focus and direct more in depth future studies. As such, its most significant shortcomings arise out of its small sample size. Beyond just raising questions about the validity of any patterns noted, this sample size has demographic limitations to consider. As noted prior, all participants share a similar age, region, and academic standing. This similarity severely limits the ability to extrapolate this data to a larger population. Future research would benefit from expanding this study to broader population. Beyond just sample size, research methods were also fairly limited given the scope and scale of the project.

While the semi-structured format did help to identify some preliminary concepts and patterns, the use of preliminary surveying, longitudinal analysis, or program ethnography may have helped to shed greater light on the findings. Although a student may discuss their patterns of self-regulation, the ability to have assessed participant's goal or attribution orientation information prior may have helped to understand and interoperate participant statements better. Moreover, given that broad diversity of programs that fall into the "MOOC" genre, a broader sample may have allowed for greater comparative analysis to aid the understanding of constructs of value, feedback, and interaction. Lastly, the dependence on participant testimony does not always accurately reflect student behaviors. Access to program data or observations of course interactions and participation may provide further insight and detail into learner behaviors

Based on this study's findings, several major areas are identified that could be immensely aided by additional research. The first is the concept of supplemental learners. A more in depth study of these populations may help to understand how common they actually are and the ways in which their behaviors may vary from other MOOC participants. The second area is the nascent genre quasi-MOOC or "pMOOCs". Given these programs radical differences from the rest of the MOOC genre, it may be beneficial to research them further in order to understand the ways in which they differ from the other MOOCs. The third main research suggestion is the need for highly targeted analysis of the motivational theories relative to MOOC student behaviors. While the fact that components of SDT, SCT, and EVT were commonly addressed by students speaks to their importance, most of these models are far too complex to be adequately assessed through simple interviewing alone. More in depth analysis of each is required to understand the multi-dimension nature of motivation and help contextualize individual factors that may impact student perceptions. In many cases, having an awareness of student predispositions and learning styles may have supported interview data findings. Surveys geared at understanding goal orientation, attributions, learning preference, and sentiments in regards to education, may have shed greater light of the stated behaviors of students and could have potentially overcome this studies limitations.

## **8.0 Conclusion**

In closing, this study's findings demonstrated multiple interesting patterns in regards to student participation and engagement within MOOC programs. First and foremost among these are observations about MOOC structures and the ways in which students utilize them. MOOCs are diverse and hard to clearly define or categorize. While efforts have been made to develop a classification system for MOOCs, the experiences of this study's participants seemed to indicate that typography remains an issue. Programs often do not fit neatly into existing subcategories and many appear to be complete outliers to the dominate typography seen in literature. These programs, deemed "pMOOCs" within this study, are unique entities that yield very different experiences for students. Additionally, this study's findings indicate that the uses of MOOCs may not be accurately reflected in research literature. Although occasionally mentioned in passing, students that use MOOC as a supplemental resource remain a relatively under-recognized and understudied group. Within this study however, supplemental learners made up a significant portion of the MOOC participants and demonstrated very distinct participation and engagement behaviors.

At a more motivationally orientated level of analysis, this study found interesting ties between constructs of value/utility and student achievement outcomes. While other motivational concepts such as autonomy, relatedness, or goal orientations were explored and discussed, no clear patterns were identified between these factors and student outcomes. In examining these findings through the frameworks of SDT, SCT, and EVT, only one theoretical model seemed to provide a clear framework for understanding

student outcomes within the context of this study. In almost every interview, participant statements emphasized perceptions of cost and value in terms similar to those of laid out in EVT. Moreover, these constructs of value/cost were the only motivational factors in this study that demonstrated a clear link to student outcomes. Student that saw a high utility value in the MOOCs that they were participating in, were far more likely to continue or complete courses than those who had enrolled out of general interest or inquiry. Although students frequently addressed many of the core concepts of SDT and SCT, such as autonomy support or relational dynamics, no clear patterns could be identified between these factors and student participation outcomes. Nonetheless, given that many of the concepts of SDT and SCT were so commonly addressed by participants it is the belief of this researcher that these motivational models are still important resources for future analysis. By utilizing alternative research methods seeking to provide greater contextualization or through the use of preliminary studies, it is possible that future studies may be better suited to address these motivational frameworks

Finally, this study's findings identify several areas that could benefit for more targeted future research. Among these are "pMOOCs", the supplemental uses of MOOCs, the role of utility value, and the impacts of autonomy, goal orientations, or attributions on student program outcomes. With continued research and analysis, it is possible that we can begin to further our understanding of MOOCs and their implication for online learning and beyond. MOOCs have forced us to challenge and reassess longstanding educational practices and constructs. They have become a staging ground for educational experimentation and innovation, opening new windows to teachers and students alike.

While only the future will tell if MOOCs represent an “educational revolution” or a passing fad, there is no denying they have had a significant impact. MOOCs represent the frontier of educational imagination and, for better or worse, they have continued to rapidly expand and evolve over the last decade. Only through continued research and exploration can we hope to avoid the potential pitfalls of this new technology and reap the full benefits that such innovations may have to offer.

## Appendix A

### Interview Prompts/Note Sheet

#### **Tell me a little about yourself and your educational background?**

- Education Experience:
- Educational Affect:
- Experience with topic/subject:
- Typical Mastery V Performance orientation:
- Learning style:
  - Notes:

#### **Can you describe the MOOC course (or courses) you took a little?**

- Sentiments:
- Subject:
- Structure
- Timeframe:
- Assignments:
- Goals/Outcomes:
  - Notes:

#### **What is your prior experience with this particular subject or online Education in general?**

- MOOC Experience:
- Online Edu Experience:
- Experience of friends or family:
- Subject Experience
  - Notes:

#### **Can you tell me a little about what made you decide to take this course? What value did you see in it?**

- Goals:
- Initial Motivation:
- Credential:
- Alternate Internal/External Factors:
- Future Benefits:
- Outcome Expectations:
  - Notes:

#### **How difficult was the course? Was there any cost (monetary or otherwise) to participating?**

- Difficulty:
- Outcomes:
- Reasons for outcomes? (Effort, time, difficulty, etc...)

- Perceived Cost/Effort
  - Notes:

**What were classroom interactions like? Did you regularly communication with teachers or other students. If so, how?**

- Student-Teacher Interactions:
  - Teacher Feedback:
- Student-Student Interactions:
- Static Interactions (video, PPT, etc.):
  - Notes

**Do you feel you had any control over your learning process? How so and how did this impact the course?**

- Assignment topics/participation type:
- Timeframe/Schedule:
- Other Autonomy:
  - Notes

**What factors do you feel continued to your program outcome?**

- Outcome attributions:
- Pros:
- Cons:
  - Notes

**Overall do you feel you were motivated/Engaged by the course? What contributed to this?**

- Motivators:
- De-motivators:
  - Notes

**How did you do in the class? Did you get what you anticipated out of it? why or why not?**

- Grades/Cert:
- Information/Skills:
- Goals Mets?
  - Notes

**In thinking about Online Learning or Massive Open Online Education, do you have any final thoughts regarding student participation and motivation in courses?**

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