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Cultural Diversity in Massive Open Online Courses: The Correlation between Cultural Indicators and Students' Attrition

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CULTURAL DIVERSITY IN MASSIVE OPEN ONLINE COURSES: THE CORRELATION BETWEEN CULTURAL INDICATORS AND STUDENTS' ATTRITION

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ABSTRACT

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Massive open online courses (MOOC) have become one of the recent innovations in the field of higher education. These courses are distributed via the Internet and free, attracting thousands of students in a course from all over the world. However, there is a serious issue concerning MOOC students' completion rates. Previous research studies have explored a variety of factors that might lead to low completion rates for MOOCs. However, students' involvement from various culture and language backgrounds was a factor not investigated in the literature—a factor that could have affected students' completion rates.

This study redesigned an activity theory model to reflect cultural factors and examined several cultural indictors related to communication, self-efficacy, technology, and Anglo-American context to determine whether these factors predicted MOOC student completion rates. The sample of this current study consisted of 133 MOOC students from 52 different countries who were enrolled at a Midwest American university. Logistic regression was applied to identify if any of the selected cultural indictors predicted MOOC students' completion. The findings suggested other cultural factors than the ones selected in this study need to be explored. Moreover, the findings of this study might enhance the research area in the MOOC field to improve students'

attrition. The potential of the redesigned activity model for investigating cultural influences in other domains was presented as a way to increase understanding of these factors.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

. One of the most recent innovations in education today is the appearance of massive open online courses (MOOC) in college and university settings. Massive open online courses recently gained popularity among both students and instructors. Massive open online courses offer free non-credit online education for thousands of people around the world and an opportunity to learn a variety of topics in a few weeks--usually between 2 to 15 weeks. Massive open online courses have rapidly become a trend in the field of higher education. A recent study (Allen & Seaman, 2013) showed that in 2012, the number of MOOC providers increased by 2.4%. Massive open online courses offer students from different locations around the world a chance to obtain education from top world universities. Since 1969, the idea of MOOC has been discussed but one of the first MOOCs was offered in 2008 when George Siemens and Stephen Downes taught their Connectivism and Connective Knowledge course (Pence, 2012). Lately, MOOCs have received much recognition from scholars in the higher education field. Since 2011, more than six million people signed up for a MOOC (MOOC U, n.d.). Some of them believed MOOCs would replace traditional higher education. Others viewed it as a new mechanism of teaching that should be explored for a greater understanding of the MOOC phenomenon. There is insufficient literature for or against the MOOC. Theoretically grounded research and evidence-based results are rare (Gillani, 2013).

Adamopoulos (2013) stated that MOOC as a worldwide online education option has offered an impressive opportunity for universities to reach global collaborations with multiple institutions. Compared to traditional education, MOOCs are larger in scale as there is no restriction on individual participation. These courses are distributed in online networks, attempting a revolution in education in a variety of disciplines such as Humanities, Social Science, Mathematics, Engineering, Computer Science, and other disciplines. Massive open online courses attract a huge number of students because of the flexibility and no required physical presence. Some MOOCs providers such as Coursera and Udacity have attracted tens of thousands of students. "For instance, as of November 2012 more than 1,900,241 students from 196 countries have enrolled in at least one course by Coursera" (Adamopoulos, 2013, p. 2). The MOOC has significantly contributed to the educational field and become increasingly global in its capacity and reach. For example, flipped classrooms, in which students watch the lecture at home and have class activities and discussion in the classroom, showed up as a result of a MOOC (Knox, 2014).

Being flexible in time and location for delivering MOOC have reached a variety of cultural backgrounds. Developing countries such as China and India were the most attractive destinations for online education because of their economic growth. However, cultural differences might affect collaboration and participation negatively among students if they are not taken into consideration in the design and implementation of these courses (Liu, Liu, Lee, & Magjuka, 2010). Instructional designers, online education providers, and developers should address cultural sensitivity when supporting international learning by reducing cultural barriers. A few studies (Brinton et al., 2013;

Chen, 2013; Liu et al., 2010; Reeder, Macfadyen, Chase, & Roche, 2004) have attempted to explore issues related to online cultural sensitivities. However, none of these research studies investigated cultural sensitivity with regard to the high drop-out rate in MOOC classes.

Statement of the Problem

Massive open online courses (MOOCs) have a serious issue of retention (Adamopoulos, 2013). From the fall of 2012 to the summer of 2013, the first 17 HarvardX and MITx courses launched on the edX platform. In that year, 43,196 registrants earned certificates of completion. Another 35,937 registrants explored half or more of course content without certification. An additional 469,702 registrants viewed less than half of the content. However, 292,852 enrolled students never engaged in the online content (Ho et al., 2014, p. 2).

Several researchers (Clow, 2013; Khalil & Ebner, 2014; Yang, Olesova, & Richardson, 2010) have discussed factors related to MOOC students' attrition but none explored MOOC students' attrition related to cultural sensitivities. Powell (1997) reported a lack in the literature of investigated cultural issues in online education. Cultural sensitivity refers to understanding and accepting other cultures through acknowledgement of and legitimacy to these cultures. Cross-cultural sensitivity requires viewing the world from other cultural perspectives. Recently, universities who offer online education have become open to adopting technologies such as MOOCs to serve people throughout the world. This transition in online education, wherein location is not required for accessibility, provides an opportunity for students from all over the world to participate in these classes. The involvement of students from a variety of backgrounds

requires considering planning issues for this expansion from a local to a global scale. Instruction and curricula should be planned, designed, and delivered to provide a cross-cultural learning environment (Grant, 2013). Hannon and D'Netto (2007) believed that delivery of online education is affected by online environment neutrality and cultural and pedagogical systems.

Most of the research done in the area of human computer interaction (HCI) focused on the evaluation system to pinpoint cultural factors or cultural differences in order to provide insight for developing design guidelines. As many of these guidelines developed, complications of the designing process arose. Related research has not revealed underlying problems of cultural factors and differences that might appear during interaction among students. It focused essentially on the cultural differences but discounted the designers' perspectives (Bourges-Waldegg & Scrivener, 1998). Designers might adopt either an atomistic or a holistic view in the design process. Designers' perspectives have an important role in determining the learners' responsibilities based on which view the designers adopt (Vä ljataga & Laanpere, 2010). More details about the role of the instructional designers and their views are provided under the Challenges of Studying MOOC section in Chapter II.

Also many studies (Glass & Garrett, 1995; Moore & Miller, 1996; Murtaugh, Burns, & Schuster, 1999) have addressed the phenomenon of student retention in educational settings. However, these studies focused on recruiting promising students and did not examine students' retention issues considering course characteristics such as MOOC (Adamopoulos, 2013).

Rationale of the Study

In general, the growth of sensitivity regarding cultural issues, especially in relation to MOOCs, has not been considered in the field of educational technology instructional design. Although a handful of researchers have started to explore cultural issues related to MOOCs, very few of their studies were formally conducted nor have their results been exclusively published. Adamopoulos (2013) recommended future studies investigate the relationship between the phenomenon of MOOCs' high dropout rate and socialization. In the same study, Adamopoulos reported that literature (Pascarella, 1980; Spady, 1970; Tinto, 1975) showed that social life in traditional education had a significant impact on the institutional fit for each class.

Hannon and D'Netto (2007) explored the impact of cultural diversity, including the organizational, technological, and pedagogical aspects, of online learners' engagement. However, their study was limited to a university in Australia. They recommended future research make further efforts to explore the phenomena of cultural diversity and online learning across different countries and across a range of universities. Their study was also conducted before MOOCs started as global online learning. Wang (2007), Cronjé (2011), and Chau, Cole, Massey, Montoya-Weiss, and O'Keefe (2002) addressed issues related to designing online courses and considering culturally diverse backgrounds. However, none of these studies discussed the relationship between the drop-out rate of MOOCs and cultural diversity of students enrolled in such courses.

Since online learning is increasingly growing and becoming global, it is important for online education providers, instructors, and institutions to explore and understand the cultural expectations and influences of participants. Investigating the impact of these

differences on learning would maintain a competitive advantage in today's online education, might help to increase the participation in online education, and assure successful design and delivery of cross-cultural online courses. There is a need to provide guidance when conducting studies and developing new theories (Liu et al., 2010).

Thus, the current study was designed to produce relevant information to improve the quality of the instruction and the logistics of MOOCs offered at American universities and colleges. The findings of this study could help large universities accommodate their linguistically diverse students who are enrolled in online courses or MOOCs. Therefore, if the universities utilize recommended strategies for improvement of MOOCs, drop-out rates, which are generally high in such courses, might potentially decrease.

Relevant Vocabulary

Activity theory. A framework for a system that views people as socio-culturally embedded actors. This descriptive theory consists of six components: subject, object, tools, community, rules, and division of labor (Engeström 1987).

Communication. That "which mediates an individual's ways of thinking and speaking, is an important cross-cultural variable that is often neglected in existing cultural frameworks" (Liu et al., 2010, p. 180). Inadequate language for students who participate in online education tends to increase other cultural problems such as misunderstanding. Language barriers could affect online education, especially when students participate primarily in written communication in asynchronous courses (Ku & Lohr, 2003).

Community. Individuals or groups of people sharing the same object within the activity system.

Cultural differences. In this study, the differences of the cultures among the students were reviewed regarding three aspects: power distance, native versus non-native English speakers, and country of origin related to income and technology. First, power distance is from Hofstede's (2001) cultural dimension model, which refers to the perceived distance students from various cultures feel toward each other and toward the instructor. Second, since the majority of MOOCs are designed and presented by native English speakers, non-native English speakers experience barriers based on linguistic issues. Students in the MOOCs were categorized as either native or non-native English speakers. Third, students from low-income countries with less developed technology would experience MOOCs differently than students from a high-income stratum or those students who came from developed countries. Students were categorized based on country of origin as related to income and technology levels.

Cultural indicators. All factors addressed in third research question: communication, the ability of preforming learning tasks and activities in an online environment, comfort in working with predominantly Anglo-American context patterns, and technological competencies. These indicators were measured to determine cultural sensitivities among participants.

Culture. "Culture includes race and ethnicity as well as other variables and is manifested in customary behaviors, assumptions and values, patterns of thinking and communication style" (Borgman, 1986, p. 49).

Division of labor. Subject activity role inside the community.

Massive open online course design relating to cultural factors. All design aspects that could be diverse among cultures such as assigning due dates that take into account particular time-zones, culturally sensitive visual material, and material that might be politically objectionable. For example, in many cultures, it is important to show people who dress modestly or appropriately for their cultures.

Object. The purpose of an activity with an exact goal or outcome.

Organizational issues in online learning. Instructional design strategies that may vary among different cultural learning environments.

Pedagogical issues. Different instruction strategies used among different cultures. For instance, differences between Western and Eastern cultures indicate that the U.S. education system tends to be process-oriented with a focus on students' interaction and participation, while in Eastern cultures, the education system tends to be more structured and lectured oriented with emphases on students' performance. The learning style also varies among students from different cultures. Some students might not feel comfortable having peer-reviewed assignments or being in a less structured learning environment (Zhang, 2007).

Rules. Formal or informal community norms, constraints, and practices.

Self-Efficacy. "The beliefs in one's capabilities to organize and execute the courses of action required to manage a prospective situation" (Bandura, 1995, p. 2).

Student characteristics. Refers to characteristics influenced by a student's culture such as critical thinking versus rote memorization, working with other genders, eye contact, and intrinsic versus extrinsic motivation.

Student difficulties. Challenges facing MOOC students, especially developing nations' students. These challenges are due to cultural barriers, lack of digital literacy, technology quality, structure of learning, and level of English language proficiency. Dealing with these difficulties is not only limited to course presentations but includes course content and activities.

Student retention. There are multitudinous definitions of retention in the literature. According to Crawford (1999), student retention is the continued enrollment in a particular class throughout one semester. Walleri (1981) related the definition of retention to an on-time college graduation, which is typically considered to be within four or five years. For the purpose of this study, retention was related to the MOOC students' completion rate. A MOOC is considered achieved when a student completes all the required course assignments with a grade of 75% or higher and receives a certificate of completion at the end of the course.

Subjects. Humans involved in an activity to solve a problem or reach an outcome.

Technology competencies. Computer literacy and technology quality challenges facing participants in MOOCs. For example, in some developing countries such as Sri Lanka, while there are Internet connection in the capital city, many of the other small towns have no Internet connection, which makes it challenging for MOOC participants to engage in their courses because they have to drive to other locations to get connected. The challenge of the connection is not limited to the accessibility to the Internet but also to its speed. Massive open online courses' high quality videos take a long time to download or sometimes fail. Computer literacy is another challenge for some developing

countries' participants. Some people are unfamiliar using computers unless they receive physical support. The computer literacy level in some of the developing countries is still in the beginning phase. Some people are unfamiliar using computers unless they receive physical support because they have not been exposed to computers and practice due to their economic status (Liyanagunawardena, Williams, & Adams, 2013).

Tools. Any physical or mental aid a subject uses to reach the goal or the object.

User interface design.

> Human-computer interface (HCI), also called users interface, is the medium of transmission and interchanging information. It is also the talk port between human and computer and is the important components of computer system. It refers to the combined face of information exchanging and functional touch or mutual affection between human and computer. (Yan, 2011, p. 3115)

Purpose of the Study

The purpose of the current dissertation was to explore who was studying in MOOCs and their demographic information in terms of country of origin, language, level of education, and employment status. More specifically, it was to address the impact of cultural diversity upon completion of a MOOC relating to communication, skills to perform learning activities in online environment, technological competencies, and relationships among those factors. In other words, this research investigated how MOOC students' communication, technological competencies, and comfort in working in a predominantly Anglo-American context would affect course completion rate.

Research Questions

The overall question guiding this study was what is the relationship between the completion rates of MOOC classes to the design of MOOC classes including content,

activities, or lectures related to cultural indicators? The following research questions were formulated to address this guiding question:

Q1 What are the characteristics of MOOC students such as their level of education, gender, and employment status?

Q2 What are the reasons for MOOC students to study MOOC course?

Q3 Do the following cultural indicators predict MOOC completion rates?

a. Communication

b. The ability of preforming learning tasks and activity in online environment (self-efficacy).

c. Comfort in working with a predominant Anglo-American context, and Western thought patterns.

d. Technology quality.

Theories Influencing Massive Open Online Courses

Massive open online courses (MOOCs) learning has been influenced by theories that support using technology in teaching and learning. Downes (2012) and Siemens (2005) are Canadian researchers who introduced the term *connectivism*, which refers to the describing of learning networks. They believed connectivism influenced MOOC learning. Siemens defined connectivism as follows:

> The integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements–not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing. (p. 4)

Connectivism theory is enhanced by the key principles of learning through diversity, i.e., knowledge grows by presenting diverse opinions. Learning is based on

connecting information sources and nodes. Knowledge might be acquired from non-human appliances and facilitated by technology. Learners are looking for connections and try to make sense of ideas, fields, and concepts. The intent of connectivist learning activities is the currency of information and keeping the knowledge up-to-date. Online and network tools provide learners with reliable, current, and developing knowledge. Lastly, learning is a continuous process because there is no ending since what is learned right now might be altered later because it is dependent on alterations in information and decision-making (Siemens, 2006).

Siemens (2006) believed the learning situation should be dynamic and learner-centered. However, some institutions treat learners as empty containers needing to be filled. Tools or context is the way of getting current, relevant, and contextually appropriate content. Learning knowledge has new meaning when situated in a network consisting of diverse perspectives due to reflection on the combined force of individual elements. He argued that in reality, organizations and people need to stay current; it is not appropriate to ask them to keep taking classes periodically. Most of the traditional sources such as textbooks and classes are limited in terms of currency. Textbooks were written years before using them and classes are only available for a certain time. Learners need to create a network of specialized and proficient people in their field to keep the knowledge up-to-date. Siemens (2005) argued that behaviorism, cognitivism, and constructivism have limitations regarding how learning occurs within an organization or a network. These theories have focused on how learning happens inside the learner. Even social constructivism was more focused on an individual physical presence and on brain-based activities as a socially enacted process. Nevertheless, connectivism "is

focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing" (Siemens, 2005, Connectivism section, para. 1).

Tschofen and Mackness (2012) discussed self-determination as another theory that influences MOOC learning. It provides insight regarding the relationship between individuals and the network. Self-determination was defined by Denney and Daviso (2012) as

> a combination of skills, knowledge, and beliefs that enable a person to engage in goal-directed, self-regulated, autonomous behavior. An understanding of one's strengths and limitations together with a belief in oneself as capable and effective are essential to self-determination. When acting on the basis of these skills and attitudes, individuals have greater ability to take control of their lives and assume the role of successful adults. (p. 43)

Other motivation theories are concerned about the total amount of motivation as it affects performance or outcome. Self-determination has a different concept than other motivational theories because it focuses on the quality and types of motivation. Two important elements in this theory are autonomous motivation and controlled motivation. Autonomous motivation refers to intrinsic motivation and the type of extrinsic motivation that refers to people's preference regarding activities in which they engage. By contrast, controlled motivation consists first of external regulation, in which people's behavior is dependent on external reward or punishment. Second, it consists of introjected regulation, which refers to factors such as an approval motive or contingent self-esteem encouraged and partially internalized action regulation.

Connectivism and self-determination theories are related to each other. Connectivism key principles are diverse, are connected to knowledge sources, and help keep their knowledge up-to-date. Accomplishing these principles requires learners to

have a high level of autonomous motivation. For example, in MOOC learning, learners are responsible for creating their own network of professionals who are specialized in their field, keep connected to them, and gain knowledge from them. This requires the learner to be highly motivated in accomplishing this task.

Another theory that would influence MOOC learning is personality theory. Feist (2010) described personality as when "psychologists use the term personality, they are referring to the unique and relatively enduring set of behaviors, feelings, thoughts and motives that characterize an individual" (p.114). There are two important components to be drawn from this definition. First, personality is unique, which means an individual is different from others. Second, personality is the summation of characteristics, which then reflects a certain stable way people think, act, and feel.

Earlier theoretical thinking and subsequent development of strategies and practices have influenced the application of emergent technologies in the education field. The root of learning theories goes back to antiquity. Many of these theories were based on philosophical and speculative concepts and focused on individual learning and the state of the mind (Bigge & Shermis, 1992; Tarpy, 1997). However, none of the above theories addressed the complexity of the humans' activity in their communities. Activity theory as described below provides a solution to fill the gap between emerging technology and its utilization on the field of education by addressing social life (Khanova, 2013).

Introduction to Activity Theory

Activity theory refers to a psychological framework based on the concept that humans are defined by the activities they perform on objects in the real world and by the

tools used to accomplish these activities. In addition, these activities occur within social, cultural, and historical contexts that give them meaning. Activity theory originated in Russian psychology in the 1920s and 1930s. Marxist philosophy (named after Karl Marx) has heavily influenced theoretical explorations of Russian psychology (Kaptelinin & Nardi, 2006; Leont'ev, 1977). "In the theory of Marxism the teaching about human activity, about its development and its forms, has had a decisively important significance for psychology" (Leont'ev, 1977, p. 12). This resulted in what has been termed a sociocultural or cultural-historical perspective. Specifically, there is an emphasis on real world experience and the influence of group versus individual on cognition. According to Leont'ev (1977), Marx had the idea that cognition could not be isolated from an activity. Cognition only appeared as a result of the interaction between the subject and the objective. An implication is that activity is the basis for all human cognition. Activity theory refers to a number of theoretical models of cognition that originated from this stance.

Activity theory fits within a variety of sociocultural theoretical perspectives that address real-world complexity. Two important components of activity theory are the subject and the object (Khanova, 2013). "The foundational concept of activity theory is understood as a relationship between the subject (that is, an actor) and the object (that is, an entity objectively existing in the world" (Kaptelinin & Nardi, 2006, p. 12).

The main idea of activity theory refers to the complex relationship of an individual subject and his or her community (Engeström, 1987). Subjects of activity have needs and these needs must be met through the interaction between the subjects and the world. An activity is a unit of life that subjects interact with to meet their surviving

objects. Apparently that activity has been influenced by the characteristics of subject and objective. For example, solving a math problem for someone would be dependent on the difficulty level of the problem and the person's math skills and ability to solve the problem. From the view of many psychologists (Leont'ev & Cole, 2009; Vygotsky, 1977; Wertsch, 1985), there are important likenesses between action conducted by individuals and social planes or by external and internal planes.

Development of Activity Theory

There have been distinctions among three generations of cultural-historical activity theory. The first generation was founded by Lev Vygotsky (1980) when he created the idea of mediation. This idea was a component of the famous triangular model consisting of subject, object, and meditating artifact. Incorporation of the artifact culture into human action was a revolution for better understanding a human in his or her context. Individuals should understand their cultural means and society would also not be understood without the individual who uses and predicts artifacts. This means raw objectives are the key to understanding the human psyche (Engeström, 1987).

The limitation of first generation, which focused on the individual, inspired the second generation of Leont'ev and his followers. Leont'ev turned the directing of activity into a complex relationship between individuals and their communities (Engeström, 1987). "It is self-evident that the activity of every individual man depends on his place in society, on the conditions that are his lot, and on how this lot is worked out in unique, individual circumstances" (Leont'ev, 1977, p. 19). The third generation was developed by Engeström (1987) when activity theory went international.

Activity Theory Model

Leont'ev (1977) added the social component to the activity and stated that activity did not exist outside the individual. However, he did not present an explicit structure or model that showed collective activity. His activity concept basically displayed the subject/object interaction. This limitation by Leont'ev encouraged Engeström (1987) to develop a model to clarify the structure of the activity (Kaptelinin & Nardi, 2006). Engestrom stated,

> The theoretical model may be considered as an instrument for developing and applying the theory at the same time. The model invites and provokes thought experiments and concretizations...a theory is an active, evolving relationship of the model to the things the model is supposed to. (p. 212)

Engeström's (1987) model was an extension of Leont'ev's (1977 effort, which consisted of subject/object interaction. Engeström developed his model in two steps. The first step was basically similar to Leont'ev's notion of activity. However, he added a new element to the Leont'ev notion of activity--the instrument. He identified three construction and application steps of the activity model: subject, object, and instrument (see Figure 1). The object draws from previous knowledge about a certain problem. Constitution of the object usually occurs without an individual's awareness. However, the object will never be achieved without an effort form the subject. Essentially, a subject plays an important role in the model, e.g., elaborating the model. The subject has the ability to modify the model into a more complex development form (Engeström, 1987).

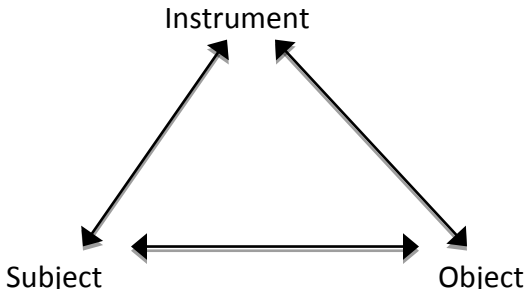

Figure 1. Engeström's simple model of an activity system.

In this step of the model, a subject remains an individual and apparently no community has been involved in the model. The second step of developing the model is the transition from individual action to collective activity (Engeström, 1987). Kaptelinin and Nardi (2006) provided an example clarifying the transition of Engeström's model. For example, an interaction designer who is a member of a team must redesign an application interface (the object) for the company. To accomplish this mission, they have to use some tools, which could be computers or software. The interaction between the team members should be mediated by explicit and implicit rules such as following a meeting schedule. Meeting the object is the responsibility of all team members. The interaction designer has to coordinate with other team members' work. This coordination would be completed by a division of labor (see Figure 2).

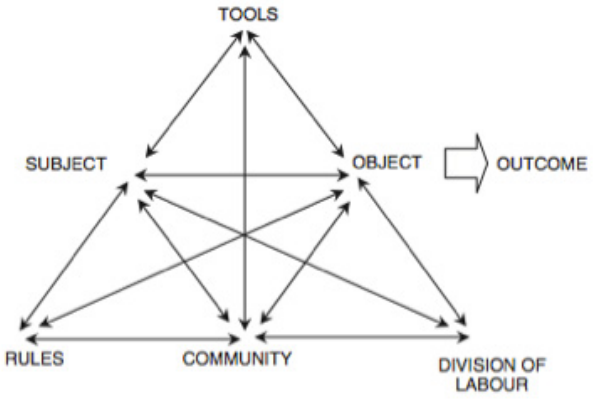

Figure 2. Engeström's complex model of an activity system adopted from Jaworski and Potari (2009).

Connection Between Activity Theory and This Research

In this study, the researcher attempted to address the complexity of cultural indicators influential in MOOC including communication, self-efficacy, Anglo-American context, and technology quality. The researcher drew on Engeström's (1987) collective activity model. In a MOOC, students who are the subjects in the model use online tools to reach an outcome with the addition of a community that reflects its culture and shares responsibility for reaching goals and outcomes. When a community is added, rules come into play about collaborative efforts. There is also a division of labor in terms of different roles and tasks within MOOC as students collaborate in an online environment. Together, the subject must follow the rules about a division of labor in order to collaborate with the community, which then can complete goals. This is the complex system of activity represented by Engeström's model. In a MOOC, cultural sensitivity must be considered in order for students to complete the course successfully.

Engeström's model for activity theory illustrates how each cultural indicator in this study fit in the model.,

Communication

For the purpose of this study, communication is interpreted as a way of human thinking and speaking, which are important components of the complex human activity system. Community is one of the essential elements in the system model. According to Engeström (1987), communication is a specific human activity that is necessary to be considered a part of the community. Massive open online course students need to communicate with each other and the professor to become part of the community and to complete the course. Communication is in English, which is not always students' first language, can lead to challenges and misunderstanding. Using only online tools such as a discussion board, email, or blogs, students do not have visual cues to help with understanding. Members of a community should be able to communicate effectively to achieve success in reaching goals.

Self-Efficacy

For the purpose of this study, self-efficacy relates to a student's ability to perform certain tasks or activities in the course with confidence. Self-efficacy fits in how confident students are with using tools as an activity in the triangle model. According to the activity model, the student is the subject who needs to use tools. Self-efficacy is demonstrated by how confident a student is in using the tools. This relates to the ability of a subject in any activity to reach the outcome or an objective (Wang, Shannon, & Ross, 2013).

Anglo-American Context

This relates to the context of MOOC courses that are mainly offered by American institutions. Using Engeström's activity model, the Anglo-American environment relates to the rules students need to follow such as assignments, grading policies, teaching styles, and participation. Students need to understand the rules before they can use them to reach the goal of completion. Cultural diversity of students in an Anglo-American dominant MOOC might challenge students' ability to understand and follow the rules. This might lead to a student's decision to not reach the desired goal--the completion of the course.

Technology Quality

This refers to hardware, software, and the online service level such as Internet connection quality. According to the activity model, technology is the major tool used by the subject to reach the object. In MOOC, students must have a computer with Internet access in order to complete the course. The quality of the tools might also affect the ability of the student to complete his/her goal of completing the course. For example, low Internet quality could present challenges to student participation and the ability to complete the course.

Significance of This Study

The outcome of this study could provide more information that would address existing gaps in MOOC design by drawing attention of MOOC designers, instructors, and providers to consider cultural factors in the design of MOOC classes. The result of this study might also clarify the problem of having high dropout rates in higher education that might be linked to cultural considerations, especially in the MOOC learning environment.

Overall, this study offers a unique contribution to the field of educational technology by revealing that MOOC providers need to remove cultural barriers including language, style of teaching and learning, cultural characteristic, and MOOC designs related to cultural factors and technology factors.

Recently, Brinton et al. (2013) conducted a study about the correlation between MOOC students' behavior and drop-out rates. Although the findings of this study considered discussion forum activities to understand the students' behavior, this study did not explore the impact of cultural factors of MOOC students on the completion of the course. Another study was conducted that reported the statistical metrics of 17 MOOC courses offered by Harvardx and MITx (Ho et al., 2014). In their study, researchers provided a dataset of a number of metrics including global enrollment, certificate attainment, gender and age composition, and education levels that could be accessed on a world map country-by-country. While this study offered very valuable information that shed light on the demographic characteristics of participants, their gender, and education levels, there was no interpretation of these metrics with regard to cultural factors. A recent study by Cheung (2014) addressed the relationship between social interaction and student retention but did not shed light on cultural indicators that might influence the course completion rate. An investigation of attrition rates using an activity theory model that considers socio-cultural influences might shed additional light on these drop-out rates, especially when international students are taking MOOC courses designed primarily from a Western cultural perspective. Therefore, the purpose of the present study was to explore the correlation between the cultural factors consisting of communication, self-efficacy, comfort in working with Anglo-American context, and the

quality of technology and its effect on the dropout rate of students participating in a MOOC.

Limitations

There were several limitations in this study. First, the findings of this study were limited to self-reported survey in which the accuracy of the responses might have been compromised. Second, the participants of the study were recruited from only one MOOC class. The finding of this study might not apply to other online course context since this study was limited to MOOCs. Hence, the sample of this study did not represent the general population; thus, the findings of the study should not be overgeneralized. Third, this was a quantitative study that did not include an analysis of qualitative studies related to the research issues. Despite all the limitations mentioned, the result of this study provides an insight on how the findings influenced the general MOOC population. The final limitation was the study instrument was compiled from various subscales taken from other existing instruments. Even though the validity and reliability of the original subscales have been proven, the existing instrument might not exhibit similar validity and reliability.

CHAPTER II

LITERATURE REVIEW

Recently, the wheel of education has turned from traditional strategies and teacher centered methods to more flexibility and learner-centered ones. This shift is related to emergent computer and information technology that has been integrated in the education field. This enormous shift has affected institutional strategies of teaching, teachers' instructions, and learners' perspectives. The field has become more information-creation oriented than information-distribution and has shifted from individual construction to more collaborative co-construction.

The massive open online course (MOOC) is a specific area of development in distance learning, which consists of world-wide participants who have access to the course via the Internet with no formal accreditation (Martin, 2012). These courses are massive in the sense that they can attract thousands of participants. They are open and free, allowing participants to use the network to distribute and share their thoughts, experiences, knowledge, ideas, and understanding. Massive open online courses provide structured curriculum and give participants the authority to make their own social and conceptual connections to meet their learning needs by automated means and manage their own learning (Tschofen & Mackness, 2012). Mott and Wiley (2009) argued that the learning management system (LMS) is no longer an effective online delivering tool. Definitely, LMS offers a well-prepared schedule and provides assigned homework and

reading materials. It also depends on a close community of students who are registered for class credit (Martin, 2012). On the another hand, since Web 2.0 has appeared, Web 2.0 offers tools such as blogs, wikis, social networks, messaging systems, etc. that have more autonomy, diversity, openness, and connectedness than the LMS. Learners have more flexibility over the learning environment using Web 2.0 tools compared to LMS (Tu, Sujo-Montes, Yen, & Blocher, 2012). As learning has moved from instructor-centered to learner-centered, learners are seeking a place where they have the ability to create their own learning network, preferred tools, and sources. An additional feature is learning is no longer limited to formal institutions. People who rely on MOOC are able to learn via the network and create their own learning environment outside of formal institutions. In order for MOOC learners to achieve their goal of creating their learning environment and learn by themselves using multi online tools, they need to be self-directed to take control of their learning (Vä ljataga & Laanpere, 2010).

Types of Massive Open Online Courses

Jasnani (2013) distinguished between two types of MOOC: cMOOC (the "c" stands for connectivist) and xMOOC. In the cMOOC, students generate knowledge and can search beyond the scope of the course via blogs, images, videos, articles, etc. The cMOOC has assigned reading and weekly schedules for students to follow. Students develop their own paths to make sense of distributed knowledge. On the other hand, the xMOOC has a more structured and linear approach wherein students have organized content for the course. Students in the xMOOC course are expected to read assigned readings and then complete unit quizzes. Compared to the cMOOC, the xMOOC is less learner action and does not include learner-generated driven content. The relationship

between the teacher and learner in the xMOOC is more traditional. The cMOOC has a discussion forum where students generate content and seek more sources than the course provides.

An example of MOOC was seen in 2011 when Stanford University started to provide an artificial intelligence (AI) course, which attracted 160,000 students who registered for this new learning opportunity (Martin, 2012). Of the initial number of students, 23,000 completed the course. It was a 10-week course that met each week and consisted of two or three 45-minute lecture videos that were uploaded to the Internet. After each video session, students would answer questions regarding the same topic and there was weekly homework. Students in this class had to create their own networks to discuss the topics and manage their time (Martin, 2012).

Challenges of Studying Utilizing Massive Open Online Courses

Along with all the advantages of MOOC learning, there are challenges in using the tools, which require learners to acquire skills to create their environment and choose the best tool to fit their personal and learning purposes (Tu et al., 2012). The main challenges of MOOC learning are the lack of the instructor role, learner personality, previous learner experience, self-efficacy, digital literacy and English Language proficiency.

Presence, which could be a challenge for MOOC students, plays a role in e-learning. There are three types of presence in education: cognitive, social, and teacher. Communication, collaboration, and presence enhance the depth of learning. The higher the level of presence in e-learning the higher the level of involvement in the online activity. The success of MOOC learning requires learners to be active in their learning

by finding sources, producing information themselves in a variety of formats, and by communicating and collaborating with others in new ways. In order for people to learn through MOOC, they need to have certain levels of creativity and innovative thinking. Learners need to be aware of network intricacies to have better structure.

Lack of facilitator or instructor role forces learners to have high levels of critical capabilities in order to critique their structures (Kop, 2011). The MOOC students need to be self-directed in order to update their base of knowledge and skills. Students' self-direction consists of domains that are both activity-oriented and disposition-oriented. As mentioned previously, learners have more control over their learning goals, strategies, objectives, resources, and activities. Learners make their decisions based on preferences and interest. Until recently, higher education has offered teacher-controlled systems and has not left students in an area where they make their own decisions (Vä ljataga & Laanpere, 2010). Learners need to feel comfortable, trusted, and valued in the learning environment in order to engage successfully in online learning environments (Kop, 2011).

Personality can play a strong role in MOOC learning. For example, if the learner is shy, he/she might hesitate in sharing his/her ideas or thoughts and might have some fear about his/her mistakes that would create a barrier for presence. For people who do not have advanced computer skills or are not technology oriented, this could affect their ability in creating platform tolls and finding sources. People who have learned using MOOC methods should at least have some skills about recent tools that could help them create their networks. Placing higher education students in situations where they have to create their personal learning environment should prepare them for intelligent decision-

making. Students acquire knowledge and skills if they engage in a situation where they create their own learning environment. All the challenges mentioned earlier would help learners develop the capacity for intelligent decision-making.

Learner experience in a MOOC is an important issue that should be considered. A recent study (Milligan, Margaryan, & Littlejohn, 2013) has shown students' motivation, confidence, and MOOC prior experience affected their engagement. Some students could not see the value of MOOC because they were frustrated with a prior MOOC experience. Another study by Tu and McIsaac, M. (2002) showed that in online education, students with high levels of intrinsic motivation tended to have better ability to complete their courses, had a higher positive self-perception, and had more quality task engagement. Yang (2014) reported a strong correlation between MOOC students' attitudes and their participation. Moreover, he revealed a strong correlation between students' competence regarding technological ability and their attitude. Wang, Peng, Huang, Hou, and Wang (2008) argued that many factors influence the online learning outcome such as intelligence level, learning strategy, and motivation, which is the dominant one.

Literature showed that self-efficacy is another important factor that has an effect on students' confidence level, online learning accomplishing, and satisfaction (Sun, Tsai, Finger, Chen, & Yeh, 2008). A study by Wang and Newlin (2002) concluded that students with high levels of self-efficacy were more disposed to accomplishing online learning with high outcomes.

> The literature on learner experiences in MOOCs has also shown that digital literacy, English Language proficiency, students of learning, the delivery environment, the perceived value of learning and critical literacies to efficiently

> valuate large quantities of information play a key part in shaping a learner's MOOC experience. (Liyanagunawardena et al., 2013, p. 2)

The majority of MOOCs are offered in the English language, in which not all people from developing countries are competent. Most of these countries have their local language, which limits access to a MOOC. For example, making a dynamic discussion for all MOOC students could be challenging because it might be interpreted differently based on the native language of the learner (Liu, Liu, Lee, & Magjuka, 2010; Liyanagunawardena et al., 2013).

Since the MOOC is a worldwide learning environment, cultural differences might negatively affect students' participation (Milligan et al., 2013). In a culturally diverse learning environment, such MOOC intercultural communication is a challenge. Individuals in this environment have different expectations about how to establish credibility, exchange information, motivate others, give and receive feedback, or critique and evaluate information. Miscommunication might occur in such MOOC learning environments due to differences between communication patterns across cultures. Moreover, whenever the cultural difference in students' perception of the activity is great, it might increase the miscommunication (Liu et al., 2010; Reeder et al., 2004). Since these issues shape a learner's experience in MOOC, they should be considered and addressed through research in the field of distance education. Also, growth in the distance learning field and the appearance of related issues such as cultural differences during online learning requires conducting studies. There have been inadequate studies addressing cultural issues in the field of online learning. Research that demonstrates the lack of cultural differences during online learning would help online education providers understand students' different education values and cultural expectations. Furthermore,

in order for online education providers to offer a competitive advantage of online learning, they should consider these differences (Liu et al., 2010).

Instructional Designers' Challenges

The challenges are not limited to the students but also includes instructional designers who face the challenge of creating instruction that fits all learner preferences. Two main characteristics affect a designer's instructions: atomistic and holistic.

> An atomistic approach views instructional design as a prescriptive step-by-step process designed by an instructional designer who is the only one who makes instructional decisions based on his/her judgment about what students should learn, how they should learn, what their learning contexts should be, what learning strategies they should employ, and how they should be assessed. (Vä ljatag & Laanpere, 2010, p. 280)

An instructional designer who adopts an atomistic view plays the main role and he/she is the only one who decides how the learners learn using specific structures without engaging them in the designing decisions. The holistic approach is more flexible and focuses on the construction of whole learning environments that have special features beneficial to efficient and effective learning. Both holistic and atomistic approaches are still under teacher control and do not leave some area for learners to be engaged in during the designing decision. Solving the designing challenge requires involving learners in the instructions design decisions and let them play a significant role during designing the instructions (Vä ljatag & Laanperea, 2010).

An instructional designer role should be more a facilitator than a developer. He/she has to understand students' needs and skills (Reiser& Dempsey, 2007). When designing a MOOC class, socio-cultural factors should be considered as integral in understanding these students' needs and skills. Since MOOC is a worldwide educational environment, the impact of socio-cultural factors could present challenges regarding its

design, especially when students represent cultures and societies that differ from the culture for which the course was designed and which it reflects.

> A fundamental challenge for cultures of participation is to conceptualize, create, and evolve socio-technical environments that not only technically enable and support users' participation, but also successfully encourage it. Participation is often determined by an individual's assessment of value/effort. The effort can be reduced by providing the right kind of tools with meta-design, and the value can be increased by making all voices heard by supporting social creativity. (Fischer, 2011, p. 45)

The study by Grünewald, Meinel, Totschnig, and Willems (2013) showed that MOOC students were interested in more support of active experimentation and relating concepts to their own experience. A MOOC design should have a holistic process that meets the learning style of the students and should consider the learner experience from different cultures. Fischer (2011) suggested a design for a learning platform for MOOCs to support social exchange and collaboration among participants from different cultures. This guideline consisted of three main elements: meta-design, social creativity, and different levels of participation. "Meta-design transcends end-user development by studying and supporting cultures of participation not only in the area of software artifacts, but also in every domain of information and cultural production" (Fischer, 2009, p.7). The meta-design refers to creating an open system during the design time so all designers who participated in the project are willing contributors. For example, it supports the complex interactions of designers during the use time. Meta design provides a new form of a live collaboration design that supports participants from different cultures. Designers should act as meta-designers who use their creativity to support a socio-technical environment. Designers should shift from designing to facilitating the content, meaning, and functionality of the system for users to act as designers. Meta-design

provides multi-cultural users by creating technical and social conditions that support broad participation in design activity. The second element, social creativity, refers to new ideas that participants from different cultures share as an advantage of meta-design. It is based on the assumption that the individual mind is limited compared to social collaboration. The third element is different levels of participation. Normally, culture influences individual motivation for participation. To support a culture of participation requires one to analyze and encourage different roles of participation such as consumers, meta-designer, collaborators, and contributors. Cultures of participation involvement have changed technological, human-centered computing. This change created a new relationship between the individual and society.

> The major role for new media and new technologies from a culture-of-participation perspective is not to deliver predigested information and non-changeable artifacts and tools to individuals, but rather to provide the opportunity and resources for engaging them in authentic activities, for participating in social debates and discussions, for creating shared understanding among diverse stakeholders, and for framing and solving personally meaningful problems. (Fischer, 2011, p. 53)

The successes of a culture of participation require involvement of diverse background knowledge to provide support and value for different levels of participations (Fischer, 2009).

Cultural factors need to be considered in the choices designers make regarding integration of advanced technological features. Many sophisticated e-learning technology options could be involved in a MOOC design, which would help create highly interactive online courses and enhance learning experiences such as 3D virtual world simulations, games, and engaging instructional approaches such as case scenario and story, all of which need to be culturally sensitive so potentially offensive settings,

depictions, or portrayals are not presented. Among all these sophisticated e-learning tools, a challenge could face an instructional designer who participates in developing a MOOC course to find an answer for the following questions: What would be an ideal course structure for MOOC? Should the instructional flow always be linear? How much didactic instruction should be included? Is a chaotic learning experience good? Should MOOCs include a pre-assessment? Can a MOOC run without a facilitator? If not, then should multiple facilitators be assigned to a MOOC? Should a MOOC end with the course? (Jasnani, 2013).

Designing a MOOC is definitely different than designing an online course provided in a learning management system (LMS) for an average of 20 students who typically do not present the dramatic socio-cultural differences or individual differences that occur in MOOCs that enroll thousands of students throughout the world. In designing a course that is massive, open, and online, designers should consider providing an appropriate technological platform and tools for all students and have the technological savvy to carry out their designs. Often, however, faculty who are designing these MOOCs do not have the technological sophistication and their designs are prone to technological glitches. Even experienced instructional designers cannot always predict technological anomalies that could affect the effectiveness of the design even before cultural considerations are made. Moreover, faculty should consider the large number of students from a variety of countries and cultures who participate in MOOC classes and find a clear instructional design guide that would help them offer a design course (Jasnani, 2013). In the following table, Liu et al. (2010) has highlighted some emerging cultural difference themes that should be considered when designing a cross-cultural

learning environment. Existing literature indicates these variables need to be considered for improved MOOC classes.

Table 1

Summary of Cultural Themes

Dimensions	Cultural Differences	Suggestions for Course Design
Assessment	Exam-oriented vs. process-oriented; Memorization vs. application	Multiple assessment strategies; Structured and flexible assignment schedule
Instruction/Interaction	Lecture vs. conversation; Structured vs. less structured; Deductive vs. inductive (case-based learning)	Incorporate features that accommodate different cultural pedagogies
Asynchronous/ Synchronous Communication	Lack of visual cues caused communication barriers in asynchronous communication; Scheduling issue for cross-cultural collaboration in synchronous communication; Time zone differences	Balanced use of asynchronous and synchronous communication
Collaboration	Collectivism and masculinity vs. individualism and femininity; Culture differences visible, but did not negatively affect collaboration	Appreciate cultural differences
Case Learning	Lack of global cases; Lack of a relationship between U.S. case discussion and analysis and local issues of international students; Lack of international experience in regard to the online instructors	Balance the use of local and global cases; Provide more context for culturally specific examples or cases
Academic Conduct	Discrepancies between U.S. and other countries' rules of academic conduct	More education and understanding, rather than pure punishment
Language	Language barriers in reading, writing and communication	More planning and preparation; More audio/visual aids

Note. Adopted from Liu et al. (2010).

Students' Retention

Considering all previously mentioned variables for designing a MOOC would help improve these classes. Even though MOOCs have been broadly adopted by users all over the world, there is still room for improvement to meet students' needs. Clow (2013), Downes (2010); Knowledge@Wharton (2013), and Lewin (2013) stated that MOOC student retention rates were very low. Koller, Ng, Do, and Chen (2013) reported that in 2012 from the huge number who signed up for the Coursera, a MOOC class only, 5% earned the certificate of accomplishment. Ho et al. (2014) reported,

> In the year from the fall of 2012 to the summer of 2013, the first 17 HarvardX and MITx courses launched on the edX platform. In that year, 43,196 registrants earned certificates of completion. Another 35,937 registrants explored half or more of course content without certification. An additional 469,702 registrants viewed less than half of the content. And 292,852 registrants never engaged with the online content. In total, there were 841,687 registrations from 597,692 unique users across the first year of HarvardX and MITx courses. (p. 2)

Another recent study (Breslow et al., 2013) reported that retention in a MOOC is a troubling aspect. In that study, less than 5% of the students who registered for the 6.002x course earned a certificate--specifically, only 7,157 from 154,763. Moreover, 23,349 did the first problem set of the course and 10,547 completed the mid-term. Clow (2013) and Lewin (2013) stated that researchers should shed the light on the problem of student retention and address the high drop-out rate. Understanding how students collaborate online in a MOOC might help explain the retention and drop-out. When students are unable to communicate effectively with each other or have difficulty understanding the instructor, they can become discouraged and drop out.

However, the problem of student retention is not only limited to MOOCs. MacNeely (1938) conducted the first national retention study in the United States and

reported 45% as the dropout rate at 25 universities involved in the study. Addressing the phenomenon, several studies have examined the problem of student retention. Avakian, MacKinney, and Allen (1982) studied student retention and race and sex differences at urban universities. Moore and Miller (1996) studied the effect of using multimedia in student retention and learning. Glass and Garrett (1995) studied the relationship among retention and student grade, age, gender, race, employment status, college major and college attended in community college and found no relationship among these variables. On the other hand, Murtaugh et al. (1999) reported a positive relationship between GPA and retention--retention increased when GPA increased. They also found a statistically significant relationship among retention, ethnicity/race, orientation courses, residency, and first enrollment in a college. Among all these studies and their results, it is obvious that attrition is a consistent problem and there has not been enough effort made in improving student retention in the last centuries (Glass & Garrett, 1995). Moreover, when these studies did address student attrition, they did not consider particular course characteristics such as MOOCs, which have different practices. Researchers should investigate more deeply this phenomenon to reach new findings and provide insight to solve the problem of student attrition. Adamopoulos (2013) studied the relative effect of the courses, platform, and university characteristics in student retention. The results in his study showed there was a significant effect among students' satisfaction on their teacher, course materials, and course completion. He recommended future studies to re-examine the phenomenon of high dropout rate in MOOCs and look into how socialization influenced the dropout decision of students in MOOCs. Brinton et al. (2013) studied the correlation between the MOOC high dropout rate and high volume discussion threads and

found the vigor of a course's online forum closely correlated with the volume of students who dropped out of the course.

In conclusion, the MOOC is a recent development in the field of distance education and researchers and educators need to explore it in depth. Understanding the popularity of increasing MOOC learning requires deep research. Most of the literature reviewed on this topic is recent. There are numerous recommendations to investigate more issues related to MOOCs and cultural factors associated with MOOC classes.

Culture

Culture is a hard concept to define because it has a wide range of different definitions related to connection disciplines. The term itself does not depend on a specific scientific investigation. There are multitudinous definitions of culture in the literature. The following are some definitions of culture related to the current study. Honold (2000) stated, "Culture defines members of a group as distinct from members of other groupings. Culture creates an orientation system and afield of action for these members (p.228). Bodker and Pederson (1991) stated, "Culture is conceptualized as a "system of meaning that underlies routine and behaviour in everyday working life" (p. 122). Hofstede (2001) defined culture as "the collective programming of the mind that distinguishes the members of one group or category of people from another, where the mind stands for thinking, feeling and acting, with consequences for beliefs, attitudes and skills" (p. 5). Scheel and Branch (1993) defined culture as

> the patterns of behavior and thinking by which members of groups recognize and interact with one another. These patterns are shaped by a group's values, norms, traditions, beliefs, and artifacts. Culture is the manifestation of a group's adaptation to its environment, which includes other cultural groups and as such, is continually changing. Culture is interpreted very broadly here so as to encompass the patterns shaped by ethnicity, religion, socio-economic status, geography,

> profession, ideology, gender, and lifestyle. Individuals are members of more than one culture, and they embody a subset rather than the totality of cultures identifiable characteristics. (p. 7)

Few studies have investigated cultural issues in online education in spite of the rich body of research on cultural phenomena in education. Cultural sensitivity means understanding and accepting other cultures by giving existence and legitimacy to those cultures. Cross-cultural sensitivity requires viewing the world from other cultural perspective (Powell, 1997). Cultural differences in online learning have not been adequately addressed in educational field studies. There is still a need to investigate cultural difference issues related to online learning. As distance education has globally increased, there has been a call for understanding cultural expectations of the participants and different educational values. It requires understanding the effect of these differences in order to offer a competitive advantage in distance learning (Liu et al., 2010). This transition in e-learning—where no location is required for accessibility--provides an opportunity for students from all over the world to participate in these classes. The involvement of students from a variety of backgrounds requires considerable planning issues for expanding from a local to a global scale. Instruction and curricula should be planned, designed, and delivered to provide a cross-cultural learning environment. A cross-cultural design would maximize benefits for the e-learning community. Shedding light on factors that influence e-learning communication technology would benefit both instructors and students in increasing cultural awareness and experience (Grant, 2013). Instructors and instructional designers will encounter students from different cultural perspectives. Students must be informed explicitly of course policy when they study courses from different cultures. For example, they should be aware of the language of

the course, the assessment (i.e., peer review, weight of the grade on group assignment), pedagogical style (i.e., constructivist, behaviorist), and reasoning pattern (i.e., liner/ circular). The student's awareness of the course materials and other relevant polices would help the student have a clear picture of course expectations. Consideration of multicultural learning environments would help both instructors and students become successful in such environments (Johari, Bentley, Tinney, & Chia, 2005). After 30 years of researching and experience in multicultural education, Johari et al. (2005) reported at least eight indicators distinguish how on individual perceives quality in instruction: language, culture, technical infrastructure, local/global perspective, learning styles, reasoning patterns, high/low context, and social context.

In online courses, cultural differences might have a negative impact on students' participation (Shattuck, 2005). People are affected by their culture and it influences their interaction in general. It also influences the way people interact with computers because interaction with a system to accomplish a task requires communication between the users and the system. People normally learn their communication style, acting, thinking through their social life. Communication style affects the way people send and interpret messages and represent cultural values. An interface design, which refers to the interaction between the computer and users, should consider the communication style of the users (Reeder et al., 2004).

"Cross-cultural usability is about making websites an effective means of communication between a global website owner and a local user" (Smith, Dunckley, French, Minocha, & Chang, 2004, p. 66). Using the Internet to facilitate communication might be a new phenomenon. However, to have better a understanding of this

phenomenon, more research must be done. Most of the research conducted in human computer interaction (HCI) focused on evaluating the system to discover cultural factors or cultural differences in order to provide insight for developing design guidelines. Research has focused essentially on cultural differences but discounted the facts from designers' perspectives (Bourges-Waldegg & Scrivener, 1998). Cultural diversity is a challenge for designers since they have not considered cultural differences through personal experience or relying on intuition. However, it is costly to develop a multiple interface design for different users. Therefore, although designers should be sensitive to demographic differences, it is not clear for them what they are.

Smith et al. (2004) identified two types of usability inherent in international websites: objective and subjective. Objective issues refer to language and format convention, whereas subjective issues focus on people from different cultures' interaction with computers and websites. Objective and subjective issues of culture are usually described as part of the culture dimensions. These dimensions influence website usability during the international website design process. Usability effectiveness evaluation is the key issue in the design of international websites. However, in multi-cultural system development, there are huge difficulties in user evaluation, both locally and internationally. The process of globalization design has focused mainly on translating the objective cultural aspects such as language and date and time formats. However, designing should also reflect subjective usability such as users' values, ethics, and morals that relate to the subjective culture (Dunckley & Smith 2000). These subjective cultural values could affect both students' and instructors' expectations about learning as they might have different views about leadership styles and motivation.

Cultural dimensions of human-computer interaction could be approached by utilizing activity theory.

Addressing Cultural Factors from Activity Theory Perspectives

Nardi (1996) has brought attention to activity theory for large numbers of people by focusing on design and technology. "Activity theory offers a set of perspectives on human activity and set of concepts for describing that activity. This, it seems to me, is exactly what HCI research needs as we struggle to understand and describe context, situation, and practice" (Nardi, 1996, p. 4). In other words, the relationship between humans and technology is not limited to strict and simplistic input-output decisions but needs richer discretion for design and implementation to recognize users' differing cultural elements. Activity theory helps by providing orientating concepts and perspectives.

According to Kari Kluutti (Nardi, 1996), human-computer interaction for some time was the central element in designing computer application. Using HCI research in designing seems to be valid since the application of information processing is a branch of cognitive psychology. However, this could be deceptive because the research follows practice rather than the reverse. In fact, some researchers tend to study a successful situation to understand why this works. Activity theorists indicate that consequences do not refer to cognitive acts such as decision making, classification, and remembering; rather, they belong in everyday practice. From an activity theory perspective, a human is a part of the social matrix consisting of people and artifacts, which form context. Activity theory provides perspectives on human activity and interpretations. It is mostly a descriptive tool rather than a predictive theory. The objective of activity theory is to

comprehend the activity and unity of consequences. It provides all HCI researchers and designers with a simple and powerful hierarchy for describing activities by addressing computer users in their context.

Global interfaces should provide support for cultural diversity by offering diverse communication styles (Ford & Kotzé, 2005). Russo and Boor (1993) reported that users tend to reject products designed to fit Western culture and prefer products that are localized according to their culture and customs. Due to the growth of global e-learning, which refers to "the application of technology for the enhancement of teaching, learning, and assessment" (Seel, 2012, p.1465), designers of websites and software should consider cultural diversity. It is becoming a challenge for instructional designers to develop international e-learning environments. A website underpinning cognitive and cultural diminutions has an impact on international designing. Culture views as collective phenomena affect people's feeling, acting and thinking through a defined social environment. The effect of culture and its collective values on people's mental programming influences individual taste (Chau et al., 2002). Accordingly, instructional designers should consider cultural sensitivity when providing an adaptive instruction online design. It is a challenge for e-learning providers to design and build websites that serve a global cross-cultural audience (Gunawardena & LaPointe, 2007).

The e-learning provider could use evaluation techniques to build websites that are more culturally sensitive. Evaluating the effectiveness of the design could be done by understanding some of the factors involved in cross-cultural communication. For the purpose of this research, Hofstede's cultural model was used to evaluate measures of cultural diversity of students who participated in MOOCs.

Hofstede's Cultural Model

Hofstede (2001) developed a five-dimensional cultural differences model that included power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity, and long-term vs. short-term orientation. This model has been widely used as a framework for investigating cross-cultural communication. Hofstede developed this model based on his study of cultural differences in more than 50 countries. He extended his study when he followed up his research by conducting a series of studies using other samples. The five-dimensions are as follows:

1. Power distance refers to

   > the basic issue involved, which different societies handle differently, is human quality. Inequality can occur in areas such as prestige, wealth, and power; different societies put different weight on statues consistency among the areas. (Hofstede, 2001, p. 79)

   The power distance term was borrowed from the Dutch social psychologist Mulder who conducted studies in the 1960s about the interpersonal power dynamic. Hofstede gave countries who were covered in the International Business Machines (IBM) study a score on the power distance index (PDI). Power distance varies among cultures. For example, in a high power distance society, student/teacher inequality appears obvious--teachers are treated by respect and students have to stand up when teachers enter the room. The education process in this society is teacher-centered; teachers structure the intellectual path students need to follow and set up a strict order. In a class, students only speak when invited. In a high power distance education system, a teacher never criticizes in public. On the other hand, in a small power distance society, teachers treat their students equally

and students treat their teachers equally as well. The education process is student-centered--students find their own paths. Students in class can ask questions when needed and can argue and disagree with their teachers. Some researchers (Arenas-Gaitán, Ramírez-Correa, & Javier Rondán-Cataluña, 2011; Wang, 2007) conducted studies to address the power distance concept in online learning. Arenas-Gaitán et al. (2011) studied Chinese students and complications they encountered with self-managing as team members in comparison with Western European students. Their findings indicated that power distance could be used as part of the explanation for the Confucian traditional leadership model and Chinese students' normative behavior of avoiding collaborative learning. The non-collaborative norm was altered to some degree once the Chinese students clearly understood the need for collaboration. According to Arenas-Gaitán and his colleagues, by using Hofstede's (2001) power distance index (PDI), Anglo-American students with a low PDI had little difficulty approaching the instructor or collaborating with each other. It was not seen as disrespectful to treat others with such equality. For Chinese and Korean students, the PDI index was much higher; to approach others on equal footing was culturally inhibiting and seen as disrespectful, which made it much more difficult for them to be comfortable in collaborative teams. In terms of pedagogy, instructors should consider the concept of power distance when designing and teaching online courses. It is possible that some students are not asking in-depth questions or are not participating fully

in collaborative exercises because of cultural differences that suggest this behavior is considered disrespectful. Usually, this can be overcome when the instructor is able to communicate fully with the students about the need to be open with communication and to learn they are equal with all other online students (Wang, 2007).

2. Uncertainty avoidance refers to "the future is a basic fact of human life with which we try to cope through the domains of technology, law, and religion. In organizations, these take the form of technology, rules, and rituals" (Hofstede, 2001, p. 145). In other words, uncertainty avoidance relates to an unknown future and different societies have different levels of stress about it. Hofstede (2001) gave countries covered by the IBM study a score on the uncertainty avoidance index, which was different than the power distance score. For example, uncertainty avoidance determines the proper amount of structure in the teaching process. In a high uncertainty avoidance society such as France, both students and instructor prefer structured learning with precise objectives, detailed assignments, and a strict timetable. However, in a weaker uncertainty avoidance society such as Britain, both students and instructors despise structure and prefer an open-ended learning situation.

3. Individualism-collectivism as defined by Hofstede (2001)

> describes the relationship between the individual and the collectivity that that prevails in a given society. It is reflected in the way people live together-for example, in nuclear families, extended families, or tribes-and it has many implications for values and behaviors. In some cultures, individualism is seen as a blessing and a source of well-being; in others it is seen as alienating. (p. 209)

Similar to the other dimensions, IBM developed an individualism index (IDV) for 53 countries and regions. This index had a negative correlation with the power distance index. The IDV was validated against a large number of data sources. The relationship between the individual and the collectivity was not limited to the way they lived together. It had a further impact on people's mental programing, structure and functioning such as family oriented educational, religious, political, and utilitarian issues. For example, schools and education systems could vary among cultures. In a Western individualistic society such as Hawaii, teachers deal with individual students. On the other hand in a collective society such as China, teachers deal with children as groups.

4. Masculinity and femininity refer to " the duality of the sexes is a fundamental fact with which different societies cope in different ways; this issue is what implications the biological differences between the sexes should have for the emotional and social roles of genders" (Hofstede, 2001, p. 279). The study for IBM (Hofstede, 2001) reported that 53 countries and regions had converted to a masculinity index (MAS). This index was validated against many country data and from other sources. The criteria of evaluating both teachers and students vary among masculine and feminine cultures. For example in a masculine culture, students' performance, education reputation, and teachers' brilliance are the domain

factors. On the other hand, in a feminine culture, students' social adoption and teachers' social skills play a bigger role. Failing in school is a calamity in a masculine culture, while it is a minor incident in a feminine culture. Teachers in a feminine culture encourage weak students by praising them instead of praising excellent students as in a masculine culture. In countries such as Britain and the United States, competitive sports play a main role in the curriculum; however, in some other countries, sports are extracurricular. In a masculine culture, students compete with each other inside the classroom to make themselves visible. In a masculine culture, average students are the norm. However, in a feminine culture such as the United States, the best students are the norm. Another main difference between feminine and masculinity cultures is that in a masculinity curriculum choices are strongly guided whereas in feminine countries, students' interests play a big role.

5. Long-term vs. short-term orientation relates to the choice of focus for people's efforts--either the future or the present. For example in a long-term culture, students look for long-term achievement so they have less concern about immediate responses. On the other hand, in a short-term culture, students focus on their achievements for recent work (Barton, 2007). This dimension was found basically in students' answers to the Chines Value Survey from 23

> countries around the world (Barton, 2007). East Asian countries had higher scores than did Western countries and some Third World countries.

Hofstede's (2001) cultural model could be taken into consideration when designing multi-cultural learning environments. It is also important to meet users' expectations during their communication with the computer, which refers to the human-computer interaction.

> Human–Computer Interaction (HCI) is generally known as the study of the interface between humans and computers. It typically involves humans (the human computer user), the machine (computer), and the way they work together. It is concerned with all aspects of the design and use of computers. Research in HCI is concerned with obtaining a better understanding of how computers can be designed and used efficiently and effectively. (Seel, 2012, p. 1465)

To increase users' performance levels through communication with the computer requires increased system usability. Human computer interface design has the objective of increasing the usability of the system for users by applying several usability principles and guidelines (Ford & Gelderblom, 2003).

Cultures influence human performance in their computer interactions. Performance refers to "a term which can have different meanings in different national cultures, is usually understood to mean the results of productive labor and the behaviors used to achieve those results" (Seel, 2012, p. 1461). To consider human computer interaction performance, a cognitive process must be involved. Ahituv and Neumann (1982) mentioned four stages of the cognitive process based on computer information system theory: attention, stimulus, analysis, and response. The first stage of the cognitive process--users' attention--should help users in identifying a stimulus usually influenced by the cultural objective. Whenever the stimulus is attracted, the process will transfer to

the second stage—the identification or recognition phase. Cultural issues have strong effects on attracting user attention. For example, if the design incorporates a language or metaphor not familiar to users, it will fail to attract their attention. Therefore, it will not enable users in identifying the stimulus. The designer has to include relevant formats and metaphors to get the users' cultural attention. The third stage, analysis, relies on problem-solving, which is affected by the complexity of the problem. Usually solving a problem is based on concrete data that have not been manipulated (Ahituv & Neumann 1982). Cultural dimension normally influences users' perceptions of the concrete data. For example, based on Hofstede's (2001) model, users vary between the uncertainty avoidance and cultural dimensions. Some users in high uncertainty avoidance prefer detailed information and explanation while users in low uncertainty avoidance prefer brief data. Solving a problem potentially needs concentration that might be negatively affected by any distraction. This distraction might cause loss of concentration, reducing speed or performance. Moreover, when some users are bored or irritated, they become distracted, which causes them to lose concentration. Anxiety might reduce users' memory size if they are partially absorbed in some concern not related to the problem solving. For example, users who belong to high uncertainly avoidant tend to be more emotional and stressed than low uncertainly avoidant users. Thus, high uncertainly avoidant users might become easily anxious while learning how to navigate through an unfamiliar interface design (Marcus, as cited in Ford & Gelderblom, 2003). Moreover, other cultural dimensions could also affect a user's satisfaction during the analysis phase. For instance, power distance, time orientation, and masculinity versus femininity, if not accommodated in the interface design, might reduce the cognitive process, which results

in reducing the performance level as well during the analysis phase (Ford & Gelderblom, 2003). In the last phase--response, users' messages are normally influenced by cultural dimensions. For example, users' responses vary among the cultural dimensions. Collective users do not feel comfortable expressing personal opinions while high power distant users tend not to explicitly express their personal opinions about their superiors. These examples show a clear idea of why designers should consider users' cultural dimensions in functionality when developing an interface.

Applying these considerations in interface design would lead to increased user responses because of the appropriately provided mechanism. Therefore, Hofstede's (2001) five cultural dimensions should be considered when designing a human-computer interface because of their impact on the comfort, acceptance, and performance levels of users. The growth of global online education, which increases the number of students from different countries in one class, becomes a challenge for online education providers and institutions. There has been a call for research that properly addresses the multi-cultural issues to support online learning institutions (Arenas-Gaitán et al., 2011).

Cultural understanding is a vital component of designing e-learning. Adeoye and Wentling (2007) wrote that designers need to keep in mind that people from many different cultures might be using the e-learning system. They also need to remember that culture affects cognitive styles so designing a homogeneous system might not work across cultures. At this time, there is little research to understand how to design programs that are cross-cultural and what effect they might have on a diverse student population of e-learners. Thus, this researcher selected four cultural indicators based on

activity theory that need to be considered by e-learning designers and providers. These indicators might influence a student's decision to complete a MOOC.

Cultural Indicators

Based on the literature discussed earlier, this study explored the relationship among students' completion of MOOCs and four cultural indicators: communication, self-efficacy, Anglo-American context, technology quality, and reasoning.

Communication

The MOOC as a recent distant learning platform uses the computer and Internet to mediate communication in higher education. The MOOC became inclusively global education, which allows universities to offer courses for students from all over the world. Students in a MOOC rely on digital technology platforms to communicate and achieve their learning goals. It is important to consider cultural communication patterns that affect student participation (Brinton et al., 2013; Liu et al., 2010). Moreover, MOOCs created by American institutions are not necessary considered by international participants even though they provide accurate content reflecting other countries' cultures. The lack of English language proficiency, adequate communication infrastructure, access to computer, technical expertise, and online learning skills in many developing countries such as Asia and Africa create challenges for MOOC participation from these countries (Boga & McGreal, 2014). Language is one of the major cultural indicators that influence participation and communication of online students (Tapanes, Smith, & White, 2009). Using different communication patterns from culturally diverse students arise from issues of social equity. Many international students who have participated in an English online course reported that their cultural background and

English proficiency level created a challenge in persisting toward the completion of online courses (Warschauer, 1998). People's values and practices in different cultures are influenced by their native language, which constructs their thoughts. In all cultures, language is the main component that empowers people's daily life participation and communication, both verbal and non-verbal. The intersection between culture and language is a complex relationship; it is difficult to understand one without the other (Johari et al., 2005).

Yang et al. (2010) discussed research related to cultural differences involving students who spoke different languages and their participation in online discussions. Some factors were discussed that could cause problems with generalizability including what happens when first and second languages are found within groups. One example of this difference in languages might influence non-native English speakers to be hesitant in online discussions. Researchers considered this conservative behavior might have been demonstrated because the non-native English speakers had a perception that their language skills did not allow them to keep pace with native English speakers. Yang et al. suggested it is the responsibility of online instructors to model for all students the best ways to handle discussion topics openly, honestly, and in a direct manner. This could influence students to be less conservative and allow them to realize it is acceptable to be straightforward with their comments. This encourages all students, not simply non-native English speakers, and can be utilized across multiple cultures and languages. The importance of this influence would be to allow students to remain on task and not need to worry about any conflict caused by language barriers. This was revealed in studies of

Asian-Siberian participants in asynchronous discussions, which found Asian-Siberian students were worried about their English proficiency (Yang et al., 2010).

Self-Efficacy

Self-efficacy is another important aspect that has a direct influence on learning outcomes. Self-efficacy was defined by Bandura (1995) as "the beliefs in one's capabilities to organize and execute the courses of action required to man- age prospective situation" (p. 2). In other words, self-efficacy relates to the competence of what a person can do in a particular domain. Self-efficacy is an important element in the learning process. It influences choice, effort, persistence, and achievement (Wang, Shannon, & Ross, 2013). According to the self-regulated theory, learning is affected by students' learning motivation and strategies. Attribution and self-efficacy have a positive power in learning results. In other words, students with high self-efficacy tend to have better confidence levels and learning objectives. Attribution refers to learners' cognition of their learning behavior. Intrinsic motivation that consists of cognitive and self-improvement has an effect on learning results in distant education, i.e., participation in online learning based on learners' desires and interest in learning. Self-improvement is another aspect that refers to reasons learners choose online learning.

According to activity theory, a subject should reach his/her goal or object by using tools. In MOOCs, students must feel confident and motivated to use software and hardware tools to complete the course.

> Student self-efficacy is rooted in psychological motivations for completing or dropping out of a MOOC; likewise being part of a community of learners is rooted psychologically in terms of connectivity to others, responsibility to others, and mutual relationships to other students. (Willis, Spiers, & Gettings, 2013, Section 2.1)

There has been a call for literature to address self-efficacy of MOOC students, which might help align low MOOC completion. Addressing self-efficacy might also shed light on what motivates MOOC students to participate in and, more importunately, what makes them successfully complete. Joo, Lim, and Kim (2012) reported that in online education, self-efficacy predicted achievement for students.

Anglo-American Context

In diverse online learning environments like MOOC, instructors should pay attention to design principles and methods that best attain the desired outcomes. All course activities and tasks should be designed to be sufficiently flexible to meet learners' needs and consider different learning perspectives (McLoughlin & Oliver, 2000). There are specific aspects to design that instructors need to keep in mind as well. When considering cultural differences, one model that was useful was based on the activity theory (Honold, 2000).

Part of the activity theory looks at how cultural models are acquired and how culture is perceived. Honold (2000) stated that cultural models are developed when students are able to interact with their environment through activity as part of experiential learning. Students process cultural information by either adjusting to the environment or by becoming absorbed into the culture. However, a student's culture does not necessarily restrict how the student behaves but it can be related to how students perceive others, how the student processes information, and how he/she takes part in certain activities. This social construction of reality as part of the activity theory suggests that actions students take part in are just as real in an online setting as in a face-to-face classroom,

which is why cultural perspectives of students must be taken into account. Actions students take are also shaped by the society in which they exist.

Leont'ev (1977) stated,

> Connections between the organism and the environment that were formerly direct and natural become mediated by culture developing on the base of material productivity. Thus, culture appears, for individuals, in the form of meaning imparted by speech signs-symbol. (p. 47)

Activity of humans is represented by a relationship with culture and society. In other words, human activity does not exist isolated from society. An individual's activity is mainly shaped by his/her status in society. Human activity is affected through reinforcements by society. Society is not an external condition; it acts as motivation and goals that shape human activity (Leont'ev, 1977).

Leont'ev (1977) emphasized three main cultural elements that influence the human mind: tools, language, and division of labor. He followed Vygotsky's approach about tools in human activity. He considered tools as a transmitting wheel--carrying human experience and moving from a generation to another generation. The usage and structure of these tools have a direct impact on how humans interact with the world.

Cultures determine the appropriation and integration of tools in society. The influence of culture on the language and division of labor relates to the tools. Culture has the main role for determining the development of a concept such as the metaphor of tools, signs, and sample functionality. Individuals learn from their culture the appropriate concepts that already exist in their culture and depend on their positive and negative experiences. Leont'ev found in merging the division of labor another function of the tools. For instance, developing a tool requires specific skills by individuals in the society and makes these tools available for other members of society. This could be a first

example of the division of labor (Kaptelinin & Nardi, 2006; Leont'ev, 1977; Leont'ev & Cole, 2009).

Activity has a main characteristic--the objective. Scientific investigation has emphasized the necessity of the objective and it is impossible for human activity to be objectiveless. The objective activity consists of two features: independent existence and the production of the psychological reflection (Leont'ev, 1977). Objective is one element from the activity structure. An activity formula contains a level of interaction between object and subject, wherein the objective works as motive. Basically, the motive is an objective need that is neither a psychosocial nor biological need such as food or security. Activity need is different in animals than in humans. Animals' psychological needs relate to their biological needs and their activity is directed to that objective. On the other hand, in humans, some psychological needs are related to the biological. However, these needs are mediated by culture and society determines the guidance in achieving the objective. Leont'ev (1977) stated, "

> Under whatever kind of conditions and forms human activity takes place, whatever kind of structure it assumes, it must not be considered as isolated from social relations, from the life of society. In all of its distinctness, the activity of the human individual represents a system included in the system of relationships of society. Outside these relationships human activity simply does not exist. (p. 51)

Honold (2000) continued discussing the social construction of reality and activity theory by stating that the computer is an important component in this cultural context; the activity of using a computer within the context of online learning contributes to the ability of the student to assimilate the culture of the online class.

Whereas Honold (2000) discussed how students become assimilated into the culture of the online class, Yang et al. (2010) suggested that cultural differences

stemming from different worldviews actually help students understand the nature of culture as it relates to others in the online environment. This allows for more meaningful interaction. One other aspect suggested that when students realize others within the same online environment are from a variety of cultural backgrounds, they do not necessarily expect common behaviors or attitudes.

When considering the challenges of online learning for diverse cultures, it is important to understand that communication differences might be based on whether students are from highly individualized cultures or from more collectivist cultures (Arenas-Gaitán et al., 2011). In more individualistic cultures such as the United States, students might be encouraged to communicate openly with peers, which could lead to more collaborative learning. This could be especially helpful with topics that are new or are more difficult to comprehend. On the contrary, students from collectivist cultures might be more apprehensive about asking questions to clarify new or complex information. They might also be less willing to openly collaborate with students online. According to Arenas-Gaitán et al. (2011), these communication styles could be considered as high-context versus low-context and linked to culture. Instructors and course designers need to be aware of these types of cultural differences in order to find common ground where students can work collaboratively. Even with the best designed course, there might still be complications due to cultural misunderstandings. As reported by Arenas-Gaitán et al., research has demonstrated that when there is a culture clash, students are often unable to truly collaborate and share knowledge. Instead, their interactions tend to be on the surface and are limited to the least amount of communication required. The authors also reported that a collectivist culture could

possibly interfere with an individual student's desire or willingness to enroll in online learning. This would inhibit that individual's ability to succeed in a collaborative environment found in most online learning situations. Although much has changed around the world as more students are able to connect through the global industry and the Internet, still more research is needed in the area of how cultural diversity impacts students in better understanding the relationship between culture and online learning success.

Technology Quality

Providers of MOOC have to consider learners' connecting boundaries since MOOC is a global learning environment. Literature reported that the majority of MOOC students are from North America and Europe, are very limited from Asia, and are even less from developing countries like Africa (Ho et al., 2014; Liyanagunawardena et al., 2013). It is obvious from the demography data provided by these studies that the number of the students from some developing countries was not relative to those countries' populations. In other words, the demography data from the literature illustrated the lack of MOOC participation especially from Asia and Africa. Liyanagunawardena et al. (2013) stated that there are various reasons related to MOOC students' distribution data but it is possible that the low technology quality in these countries inhibited people's participation. Low connectivity and technology quality would limit a student's computer access and negatively affect their participation in MOOC. English language proficiency would be a challenge for those international students. Students who participate in MOOC and live in one of the regions or developing countries where there is not adequate telecommunications infrastructure could face a challenge in studying MOOC (Boga &

McGreal, 2014). For example, in Sir Lanka, the capital and most other cities have high speed Internet compared to some villages that need to rely on mobile broadband service. Also there are some areas where is no Internet connection (Liyanagunawardena, 2012). Sun et al. (2008) suggested that technology was one of the most important dimensions of student satisfaction in e-learning. This was demonstrated in their study of students in Taiwan who were extremely satisfied with their e-learning experience but had no difficulties with the technology. E-learning platforms have matured to become reliable in many areas but there are also many areas where the technology does not support e-learning capabilities. The authors asserted that where the technology dimension had not matured to optimum performance, learners could become disappointed and it might even cause some students to reject the idea of e-learning.

Reasoning and Motivation

In examining motivation and attitudes toward web-based learning and online courses, two specific aspects of motivation were delineated: intrinsic, which refers to internal motivating factors such as personal desire for knowledge or learning for the sake of learning, and extrinsic motivation, which refers to external factors such as finding employment or improving quality of life (Scanlon, 2008). Loeber and Higson (2009 identified three most frequent reasons for university learning: job relation reasons, reasons referring to the person, and continuing education to ease job insecurity. Of these three, reasons referring to the person emerged as the most important. These authors also found that social class affiliation did not appear to be an influencing factor and suggested that one reason for this was independent ways of financing their education were available.

Among the reasons students from different countries gave for enrolling in MOOCs were wanting to add skills to their current jobs, working on a degree, or often in the United States, out of curiosity (Christensen et al., 2013). It is possible that the more serious the motivation for starting a MOOC the more likelihood existed for completing a MOOC. Students who took a MOOC out of curiosity might be the least likely to complete. According to Christensen et al. (2013), more students from the United States enrolled in MOOCs out of curiosity than did students from other countries such as Brazil, Russia, China, and South Africa.

In conclusion, these four cultural indicators were selected by the researcher because they were the most relevant to activity theory. The model of activity theory contains six components: subject, tool, object, community, division of labor, and rules. All the cultural indicators related to at least one of the activity theory components. Communication, a cultural indicator addressed in this study, relates to the community, which is one of the main channels connecting people using a language. Without effective communication, students would not be able to collaborate and reach their goal of completing their course. Technology quality relates to the tool as another component of the activity theory model as well. According to activity theory, students would not be able to complete the course if there was no existing tool including hardware, software, and Internet connection. Moreover, the researcher selected self-efficacy as a cultural indicator to measure the confidence of students reaching the goal of completing the course. This might relate to rules the activity theory addressed for humans to reach their goal in any activity. Lastly, the researcher selected the Anglo American context as a cultural indicator since the MOOCs were provided by American institutions. This

cultural indicator relates to the activity theory community component. Social construction is part of the activity theory. Students' cultural perspectives in online settings must be taken into account according to activity theory since the actions students take part in are just as real in an online setting as in a face-to-face classroom.

CHAPTER III

METHODOLOGY

Purpose of the Study

The purpose of this study was to explore the relationship between MOOC students' completion rates and their different cultural and linguistic backgrounds. The researcher explored culture in students' ability to perform tasks in an online environment (specifically self-efficacy), technology quality, and comfort in working with predominant Anglo-American context aspects, which might have related to rate of completion in MOOC classes.

This current study utilized a survey as a way to measure self-reported factors. The following research questions guided this study:

Q1 What are the characteristics of MOOC students such as their level of education, gender, and employment status?

Q2 What are the reasons for MOOC students to study MOOC course?

Q3 Do the following cultural indicators predict MOOC completion rates?

a. Communication

b. The ability of preforming learning tasks and activity in online environment (self-efficacy).

c. Comfort in working with a predominant Anglo-American context, and Western thought patterns.

d. Technology quality.

Solving the Problem

This current study might contribute to the online research field by addressing the problem of students' attrition and cultural indicators. Activity theory provided a framework to help solve this problem. Activity theory emphasizes the role of society in any human activity. This highlighted how the lack of addressing cultural indicators in MOOC might lead to the problem of student attrition. According to the activity model, there is a complex relationship between the model elements: subject, tool, object, community, division of labor, and rules (Engeström, 1987). The relationship among elements might clarify how MOOC students might not finish their course due to a lack of one of those elements. For instance, if students struggle to use the tool (the software or hardware), that might lead to not reaching their object--completing the course. Also if MOOC students struggle within the community, this might affect their object. The model of activity theory clarified the complexity of the relationship between the different elements involved in students' activity studying MOOC. This clarification might lead the MOOC provider to consider all the cultural indicators addressed in this research, thus increasing MOOC students' completion rates.

Research question three related to how the elements in activity theory worked together to allow the subject (the student) to reach the object (completion of the MOOC). The problem of MOOC student attrition happens when there are barriers within the elements that interfere with students' ability to complete the MOOC. By measuring the cultural indicators, this study attempted to solve the problem by demonstrating how the cultural indicators worked together to influence MOOC completion rates. For example, one of the elements in activity theory is community. If students are able to communicate

effectively, they are more likely to build a collaborative online community. Therefore, students would be able to understand online community rules such as course policy. Also students would be more able to use the tools of the MOOC such as the software and hardware. Success with these elements might lead to higher levels of self-efficacy and higher completion rates.

Participants and Setting

The target population for this study was college level students of both genders who were asked to participate in the study. A pilot survey was conducted during the last month of the fall semester of 2014 and only students studying in a MOOC offered in one of the universities in Colorado were included. This course was provided through Coursera, an educational platform that offers free online courses. Coursera is a partner with many top worldwide universities. There were 30,216 students in this course who were asked to participate in the pilot survey. The students in this course were from 179 different countries worldwide. Of the countries represented, 22% were from the United States and 16% were from India. The other countries represented that had between 1% and 1.5% participation were China, Egypt, Brazil, Canada, and Spain. According to Coursera data, these percentages came from student computers' IP addresses. English was not the native language for all students in this course. The students in this course had a variety of educational level--from a high school diploma to doctoral degrees. Based on 2,149 responses reported by Coursera, only 5% students had doctoral degrees, 26% had master's degrees, 36% had bachelor's degree, and 11% had a high school diploma. A variety of educational and employment levels was found among the students. Of those employed, 49% worked full time, 8% worked part time, but 30% were unemployed. For

educational status, 34% considered themselves full-time students, 10% were part-time students, and 56% did not consider themselves students. Of all the students, 12% were female and 87% were male. This course is considered an X-MOOC since all the materials were provided and were well structured. This course had nine weekly assignments students submitted and each assignment was worth 100 points. Each assignment was worth 10% of the overall points. Students were allowed unlimited attempts to answer the assigned problems and were able to view their scores after the work was completed. There are no other exams, quizzes, or work that counted in the total grade. Statements of accomplishment were awarded to any student who scored a minimum of 70% from the total grades.

Another survey was conducted the following semester in a similar setting via Coursera. The participants included almost the same demographics. The participants were asked to volunteer and were chosen from a different class than the course used for the pilot study.

In order to conduct this study, this researcher collaborated with the Associate Vice President for Digital Education and Engagement at one of the Colorado universities. The Associate Vice President met with the researcher and the research advisor to discuss options for selecting courses that could be used to conduct this study. This collaboration introduced the researcher to the MOOC instructor who was asked to submit the survey to MOOC students. The researcher contacted the MOOC instructor personally through email. The MOOC instructor gave the researcher access to the MOOC class to collect demographic characteristics of students and course data necessary to complete the study. Although there are over 40 universities in the United States that offer Coursera MOOCs,

the researcher was currently studying in Colorado and chose a Colorado university as the setting for this study. Institutional Review Board approval was sought and obtained (see Appendix D).

Sampling

For this study, a convenience sampling was used. According to Remler and Van Ryzin (2010), "convenience sampling refers to a situation in which a researcher takes advantage of a natural gathering in easy access to people they can recruit into a study" (p. 154). One MOOC class was selected from Coursera MOOC courses for the pilot and another course was selected for the primary study. For the pilot, the 12-week class was offered through Coursera by a Colorado university. The course subject was Electronic Engineering. Of the 30,216 students who registered for this class, fewer than 7,000 students reported that they were committed to completing the course. The same sampling technique was used the following semester, which was the spring of 2015, to conduct the primary survey. Another course entitled Introduction to Global Energy Businesses was selected from Coursera for the primary survey. The course contained approximately the same number of students--between 10,000 and 30,000 students. A Colorado university provided the course. The course lasted for six weeks. Even though the sampling technique used in this study was a non-proprietary sampling, the characteristics of the participants matched the target population such as gender ratio and background differences. It was theoretically recommended to use random sampling. However, this study was conducted in an authentic environment, which was the reason for using a convenience sampling.

Variables

In this current study, four independent variables (cultural indicators) were addressed. One of the primary independent variables was communication between students and instructor including course materials and class activities such as discussion and writing during the class activity. In addition to communication, self-efficacy as an independent variable was considered. Based on the previous literature and empirical studies, self-efficacy is an important aspect in the learning process and has a positive power on learning results (Wang et al., 2008). The third independent variable was the quality of the technological components, which refers to the characteristics of the course provided, user-friendly software tools. For example, students needed to use little effort in accomplishing certain activities with no barriers. The higher the technological quality the higher the effect on students' technology use (Piccoli, Ahmad, & Ives, 2001). The last independent variable was the Anglo-American context, which refers to the predominant perspectives, assumptions, and cultural context in which the MOOC course design and educational materials were created. In course media and educational materials, cultural awareness helps to address the effect of cultural bias (Tapanes et al., 2009). However, as yet, most MOOC courses do not consider cultural differences and their effect on completion rates. Reasons for taking a MOOC course were considered an extraneous variable that would measure motivation for taking this course. It was interesting to discover the relationship between the reason for taking a course and students' completion in addition to the previous independent variables. Students' completion of the course and receipt of a certificate of completion was the dependent variable.

In cultures, values are the core and most consistent elements that reflect people's daily practices. Hofstede (2001) recommended measuring values primarily for studies that focus on culture. Hofstede provided a framework to study national value systems in relation to other nations and cultures. In this study, two factors were selected to determine cultural diversity in students. The first factor was language; for the current study, participants were classified as native English speaking or non-native English speaking.

The second factor was the countries' technology development levels, which were measured using the World Economic Forum's (2014) networked readiness index (NRI). The NRI is an annual publication that measures the propensity for countries to exploit the opportunities offered by information and communications technology (ICT). The NRI has been available since 2002 and was created by Harvard University's Center for International Development. The 2014 index ranked 148 countries in four sub-indexes and 10 pillars. The first sub-index is the environment and includes two pillars: political and regulatory environment and business and innovation environment. The second sub-index is readiness and includes the three pillars: infrastructure and digital content, affordability, and skills. The third sub-index is usage; it includes individual usage, business usage, and government usage. Impact is the last sub-index for the NRI and contains economic impact and social impact pillars. To identify cultural diversity from a technological standpoint, the researcher used the final NRI score, which calculated the average of the four composing sub-index scores as shown in Appendix A. Thus, cultural differences were objectively measured based on the three factors: power distance, language, and NRI scores.

Instrument

Fives subscales from five different existing survey scales were adopted for the purpose of this study. A total of 38 Likert scale survey items, ranging from *strongly disagree* to *strongly agree,* were selected to serve this study. The framework of this survey instrument focused on cultural diversity aspects of the online teaching and learning environment such as communication, technological competences, and the Anglo-American context. The survey statement formulated to measure students' levels of agreement or disagreement was based on the following subscale components. The researcher selected these subscales because they fit the cultural indicators addressed in this study. The survey includes the following six sections:

1. Personal information consisted of five questions about demographics, country of origin, whether English is the primary language, gender, educational level ranging from doctoral level to elementary school, and employment status ranging from full-time employee to self-employed. These questions required participants to fill in their personal information. This section addressed the first research question. Asking the participant some demographic questions helped to determine the participants' characteristics.
2. Communication questions in this section consisted of the participant being asked twelve 4-point Likert scale questions. Participants provided their level of agreement on these questions. These items answered the first part of the third research question. All the communication questions were related to students' communication experiences during the activities in the

MOOC course. The instrument was developed by Ledbetter (2009) after conducting three studies to assure the reliability and validity of measuring online communication attitudes. The result of these studies was the creation of a Measure of Online Communication Attitude (MOCA). From the MOCA, the researcher selected two dimensions out of seven developed by Ledbetter: self-disclosure and miscommunication. Self-disclosure consisted of seven items; reliability was a .90 Cronbach's alpha based on the Ledbetter study. Miscommunication consisted of five items; reliability was a .86 Cronbach's alpha. The instrument was tested on undergraduate students at a large Midwestern university. The researcher selected survey items to measure characteristics of communication that might determine the relationship between students and their MOOC community. Therefore, this relationship might lead to a student's decision to complete the MOOC course.

3. In the self-efficacy and competencies section, participants were asked five questions using a 4-point Likert scale. This subscale addressed the second part of the third research question. Participants rated their performance on an online task or activity. This subscale was developed by Artino (2008) to measure perceived task value and self-efficacy for a self-paced online training environment. Self-paced online training is similar to a MOOC as students study at their own pace but without interacting with an instructor or other students. The instrument was developed and tasted on Navy personnel and U. S. Naval Academy undergraduate students. The self-efficacy

subscale reported a .89 Cronbach's alpha based on the Artino study. Artino suggested replicating the study using a more diverse sample population as well as exploring issues of convergent and discriminant validity. These suggestions might serve to improve the reliability of the instrument. Self-efficacy has a positive power in learning. In other words, students with high self-efficacy tend to have better confidence levels in reaching their objectives (Wang et al., 2008). According to activity theory, the human object is influenced by many factors that relate to the human and the community. Therefore self-efficacy was addressed in this study to investigate the relationship with the student's object, i.e., completing his/her MOOC.

4. In the quality of technological components section, participants were asked eight questions using a 4-point Likert scale. These items addressed the third part of the third research question. The first four questions in this subscale were developed by Amoroso and Cheney (1991) for use in corporations to determine end-user satisfaction on technology quality. Sun et al. (2008) adopted the Amoroso and Cheney instrument and developed it to match their study. Sun and his colleagues used the modified instrument to measure the perceptions of e-learner satisfaction on technology quality. Their study was conducted in two public Taiwan universities. The items for the technology quality factor had a reliability of 0.82 Cronbach's alpha. The last four items of this subscale had a reported reliability of 0.50 Cronbach's alpha. Measuring the perception of MOOC students on the technology

quality would help to investigate the relationship with course completion. This related to activity theory when it emphasized the role of the tools used to reach an object. Students' tools in MOOC could be any hardware or software including an Internet connection.

5. In the Anglo-American context section, participants were asked six questions using a 4-point Likert scale. These questions addressed the fourth part of the third research question. Participants rated their agreement level on cultural awareness based on their experience of the MOOC course. These items were implemented by Tapanes et al. (2009) who developed this subscale based on Hofstede's (2008) value survey (see Appendix B). Tapanes and his colleagues used the self-reported instrument in an online setting to measure students' perceptions about their instructors' cultural awareness. Tapanes and his colleagues were interested in exploring various cultural dimensions such as communication patterns, language, and educational materials that may affect students' participation. Their study was conducted at two U.S. universities. Since MOOC is a world-wide learning environment, it was important to investigate how students adjusted to an American dominant learning environment. As discussed in Chapter II, part of the activity theory looks at how cultural models are acquired and perceived. Students who participated in MOOC might come from diverse cultural backgrounds, which might affect how they adopt certain learning materials. If the instructor does not consider students' cultural diversity, this might affect students' engagement.

6. In the reasons for taking MOOC section, participants were asked seven questions to rate their agreement on reasons that encouraged them to register in the MOOC course. Items in this subscale were adopted from Christensen et al. (2013) who used these items to describe the characteristics of MOOC students. Their study was conducted on one of the Coursera courses offered by the University of Pennsylvania. These subscale items answered the second research question.

Research Design

The research design for this current dissertation was a non-experimental design since the researcher did not manipulate or control the variables. This current study explored the relationship of the factors of communication, technology competence, self-efficacy, and Anglo-American context as independent variables with MOOC students' completion as the dependent variable. This research utilized a self-reporting survey. According to Creswell (2002), surveys are "procedures in quantitative research in which investigators administer a survey to a sample or to the entire population of people to describe the attitudes, behaviors, opinions or characteristics of the target population" (p. 388). In the survey, the researchers used questions to collect quantitative data. The researchers analyzed the data statistically to describe trends and test the research questions. Survey design is different than the experimental design in which researchers manipulate the conditions. In the survey design, researchers would not be able to explain the cause and effect as is done in experimental studies. However, the survey design is very common in correlational research.

Procedures

A survey (see Appendix C) was used to obtain the information regarding students' experiences in their current MOOC course. Institutional Review Board (IRB) approval of the survey was obtained (see Appendix D) before the pilot surveys were sent out. A pilot survey was conducted during the 2014 fall semester in one of the MOOC courses to assure the reliability and validity of the survey questions. Data were collected via Qualtrics--an online software program that provides solutions for online surveys. A professor in one of the MOOC classes sent the survey Qualtrics link via email to all the students in the course asking for their voluntary participation. The email provided a brief description of the study, stressed the value of the students' participation, and assured the students of their confidentiality and the option to participate. Another announcement was emailed one week later as a follow-up reminder. For the pilot survey, about 20 responses were adequate with the understanding that the average response rate to email surveys was often less than 5%. When the researcher obtained 20 responses, another email was sent as a thank you to the participants for their efforts in taking the survey.

The characteristics of the participants from the pilot survey are presented in Table 2. A total of 163 participants from 50 countries answered the pilot survey. The response rate for the pilot was more than the researcher expected. However, since none of the participants in the pilot had completed the course, this prevented the researcher from conducting a logistic regression model.

Table 2

Demographic Statistics for Pilot Study Participants

Variables		Frequency	Valid Percent
Gender	Male	152	88.0
	Female	11	12.0
Educational Level	Doctoral degree	9	5.5
	Professional school degree	7	4.3
	Master's degree	67	41.1
	Bachelor's degree	65	39.9
	Some college but no degree	6	3.7
	High school diploma	4	2.5
Educational Status	Full time student	37	22.7
	Part time student	20	12.3
	Not a student	106	65.0
Employment Status	Full time	83	50.6
	Part time	16	9.8
	Unemployed and looking for work	29	17.7
	Unemployed and not looking for work	18	11.0
	Other	18	11.0

Moreover, factor analysis was conducted to assure the reliability of all factors selected in this study. Almost all factors showed fairly high Cronbach alphas: communication was .806, the technology factor was .693 after two items were recoded because they were negatively worded, the Anglo-American factor was .793, and the self-efficacy factor had a .814.

The following semester, which was the spring of 2015, a second study based on the pilot surveyed participants in another MOOC class offered through Coursera. Minor modifications to the survey items were made based on the results from the previous semester pilot survey to improve the survey validity and reliability. Subjects who

participated in the previous semester pilot test were excluded from the subsequent study since the same survey with minor modifications was utilized. The researcher sent an email after the course was over to ask students to voluntarily participate in the survey. The email emphasized the value of student participation and stressed their confidentiality and option for participation. The survey was open for three weeks with a reminder after the first week. A thank-you email was sent to participants after collecting an adequate number of responses. The survey results were collected via Qualtrics by the researcher after sending the thank-you email.

Data Analysis

The purpose of this study was to explore the relationship between MOOC students' completion of the course and their different cultural and linguistic backgrounds in MOOCs. Aspects of encountering cultural diversity in students' ability to perform tasks in an online environment, technological expertise, and comfort in working with a predominant Anglo-American context might also relate to attrition in MOOCs. The Statistical Package for Social Scenic (SPSS) software was used in this research to perform all statistical analyses. The SPSS is a widely used program by social scientists, health researchers, survey companies, government, education researchers, marketing organizations, data miners, and others to dissect the data. A series of steps was used to analyze the data to determine the representativeness of the sample. More specifically, the analyses calculated the percentage of native English speakers versus non-native English speakers (those for whom English is a second language) in the sample, level of education for every individual subject (from high school diploma to doctoral degree), employee

status, country of origin, and their relationship to course completion. Descriptive statistical analyses were used to answer the first and second research questions

Means, frequencies, and standard deviations were computed on all relevant demographic variables including level of education, ethnicity, gender, primary language spoken in the home, and employment status. Logistic regression was conducted to answer the third research question. Logistic regression is defined as

> a binomial logistic regression (often referred to simply as logistic regression), and predicts the probability that an observation falls into one of two categories of a dichotomous dependent variable based on one or more independent variables that can be either continuous or categorical. (Lærd Statistics, 2013, para. 1)

Utilizing logistic regression accurately relies on following certain assumptions. In this study, utilizing logistic regression in particular was because it met the assumption of the dichotomy of the dependent variable. It was recommended to check these assumptions before running the data analysis to ensure valid results. Logistic regression was appropriate because the dependent variable was a categorical variable while the independent variables were continuous variables. The dependent variable referred to whether the students completed the course or not, which was measured on a dichotomous scale. The independent variables were measured on Likert-type scales because they were considered ordinal variables. Use of logistic regression determined which factors were significant in predicting MOOC completion. The dependent variable was mutually exhaustive and exclusive because the response would be either "yes" or "no" and no other option is available. A linear relationship between the independent variables and the dependent variable existed and was measured using logistic regression.

It was assumed there would be no homoscedasticity in the results. Because there was direct linear regression between each independent variable and the dependent

variable, no homoscedasticity was found. This is because each probability distribution for *y* (the response variable) had the same standard deviation regardless of the *x*-value (predictor). Moreover, there was no multicollinearity because none of the independent variables interacted with each other. It needed to be clear how each independent variable contributed to the variance explained in the dependent variable. To perform multiple regression analysis, this study had no significant outliers, high leverage points, or highly influential points as confirmed using an SPSS analysis. A final analysis checked to make sure any residuals or errors were approximately and normally distributed using a histogram.

Researcher Stance

As an international student studying my Ph.D. in the United States, I have experience as a participant in a MOOC dominated by American institutions where the course was offered in English--my second language. Communication was an issue for me as a bilingual student. In the online environment, sending a message to other students or understanding a message was not as easy as in the traditional classroom. In an online environment, there is no facial expression or body language that helps the recipient understand a message. I had to read every single word and sometimes I needed to read the post or message more than once to ensure I understood. As an international student, studying online was time consuming and I struggled. In an asynchronous class such as the MOOC, there is not the same opportunity to share ideas with other students in the same way as in a traditional classroom. I was not always confidant about replying to the professor's messages or in knowing the appropriate way to communicate with the professor. The culture of students questioning the professor is different in the United

States compared to my culture where that is seen as criticizing professors, which is considered rude. I was not confident about my participation in the course activities because I was not always sure of the professor's or other classmates' expectations. The course was American teaching and learning dominant and some issues that seemed to be overlooked included not being aware of time differences and how access to websites could be censored or controlled by other governments. For example, if an assignment was due in the morning on a specific date, in my country that due date is a different time. Some assignments required watching YouTube videos without realizing that students in many countries are forbidden to access YouTube. Peer review was a new experience for me because my experience with education had never included this level of student collaboration. I had a strong intrinsic desire to complete the course; however, there were other factors that could have influenced my decision to finish. After this experience, I wanted to understand how other non-native English-speaking students in other cultures experienced MOOCs that were American dominated. I wanted to explore if students from other cultures would have the same experience as I had or how factors such as self-efficacy, communication, the quality of technology, and Anglo-American dominant context might affect student completion rates.

CHAPTER IV

RESULTS

Introduction

This chapter provides the results of the data and statistical analysis, which were described in Chapter III. The purpose of this study was (a) to explore the demography information about massive open online course (MOOC) students and (b) to explore the relationship among MOOC students' completion rate and the following cultural indicators: communication, self-efficacy, comfort in working with a predominant Anglo-American context, and technology quality. The first section presents the data collection process. The second section presents the descriptive analysis of the sample and answers the first two research questions. The third section presents the factor analysis of the variables. The last section answers the third research question

Data Collection

A pilot survey was conducted to ensure an acceptable reliability level of the survey items. The survey was sent to 1,412 students from two different classes but only 133 MOOC students responded—an overall response rate of 9%. The data collection lasted for three weeks with one follow up reminder. The following paragraphs provide answers to the research questions and descriptive statistics are presented in Table 3.

Research Question 1

What are the characteristics of MOOC students such as their gender, country, level of education, education status, and employment status?

Table 3

Demographic Statistics for Current Study

Variables		Frequency	Valid Percent
Gender	Male	117	88.0
	Female	16	12.0
Educational Level	Doctoral degree	6	4.5
	Professional school degree	7	5.3
	Master's degree	66	49.6
	Bachelor's degree	44	33.1
	Some college but no degree	9	6.8
	High school diploma	1	.8
Educational Status	Full time student	27	20.3
	Part time student	15	11.3
	Not a student	91	68.4
Employment Status	Full time	77	58.3
	Part time	20	15.2
	Unemployed and looking for work	20	15.2
	Unemployed and not looking for work	5	3.8
	Other	10	7.6

The descriptive analysis included calculation of the frequencies and valid percentages. The majority of the students were male (88%) and only 12% were female. Although there were various educational levels among the participants, the majority had a masters' degree. The employment status also varied among the participants but the majority was full time employees.

The participants were from 52 different countries (see Figure 3). These countries were placed in five categories based on the Network Readiness Index (NRI) and English as the primary language or second language (see Table 4). Each category contained 10 countries except the last one, which contained 12 countries. The categories were ranked from the highest to the lowest in information and communication technology (ICT), excellent digital infrastructures, and outstanding business and innovation environments.

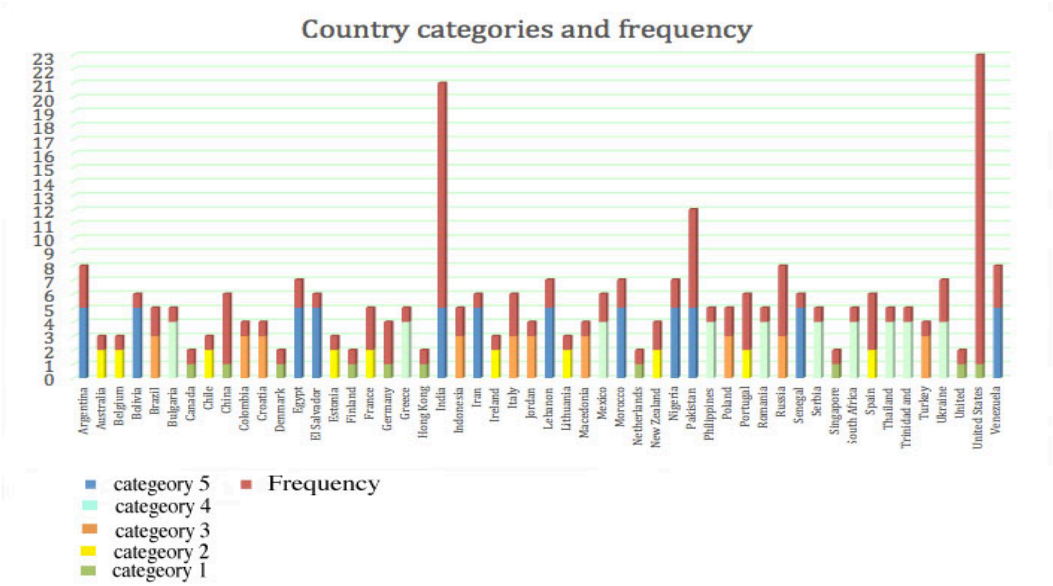

Figure 3. Country categories and frequency.

Table 4

Country Categories Based on the Network Readiness Index and Language

NRI Category	English as Primary Language	English as Second Language
1	10	24
2	5	4
3	19	0
4	10	3
5	28	12
Total	82	43

The main outcome, which was the dependent variable of this study, was student completion rate of the course. As shown on the Table 5, almost half of the participants completed it.

Table 5

Student Course Completion Rate

Outcome	Frequency	Percent
Not completed	72	54.1
Completed	61	45.9
Total	133	100.0

Table 6 shows the frequencies of both genders versus the completion rate and reported more males completed the course compared to females. A Pearson chi-square was conducted to investigate if there was any association between gender and the completion rate. The test showed a *p*-value of 0.04, which was slightly smaller than the 0.05 level of statistical significance, which might mean a marginal correlation between gender and completion rate.

Table 6

Gender and Completion Rate

Gender	Completed	Non-completed	Total
Male	67	50	117
Female	5	11	16
Total	72	61	133

Table 7 provides the frequencies of English native speakers students and non-native versus the completion rate. As shown, more non-native completed the course versus native speakers. A Pearson chi-square was conducted to investigate if there was any association between language and completion. The test showed a *p*-value of 0.776, which was greater than the 0.05 level of statistical significance 0.05, and indicated an association between English as a native language and non-native speakers and completion rate.

Table 7

Language and Completion Rate

Language	Non-completed	Completed	Total
English native	24	21	45
English non-native	47	37	84
Total	71	58	129

Research Question 2

What are the reasons for MOOC students to study MOOC course?

Students reported their agreement on five reasons that motivated them when studying a MOOC course (see Figure 4). Only 57% agreed with the first reason--"I enrolled in this course to explore the Massive Open Online Course." However, the majority of the students (70.4 %) agreed with the second reason--"I enrolled in this course to gain specific skills to do my job better." A majority (72.8%) of students disagreed with the third reason--"I enrolled in this course to be in this particular professor's class." Conversely, 86.7% disagreed on the fourth reason—"I enrolled in this course because someone I know recommended this course to me." Not quite two-thirds (62.3%) of students agreed with the last reason--"I enrolled in this course for personal knowledge development."

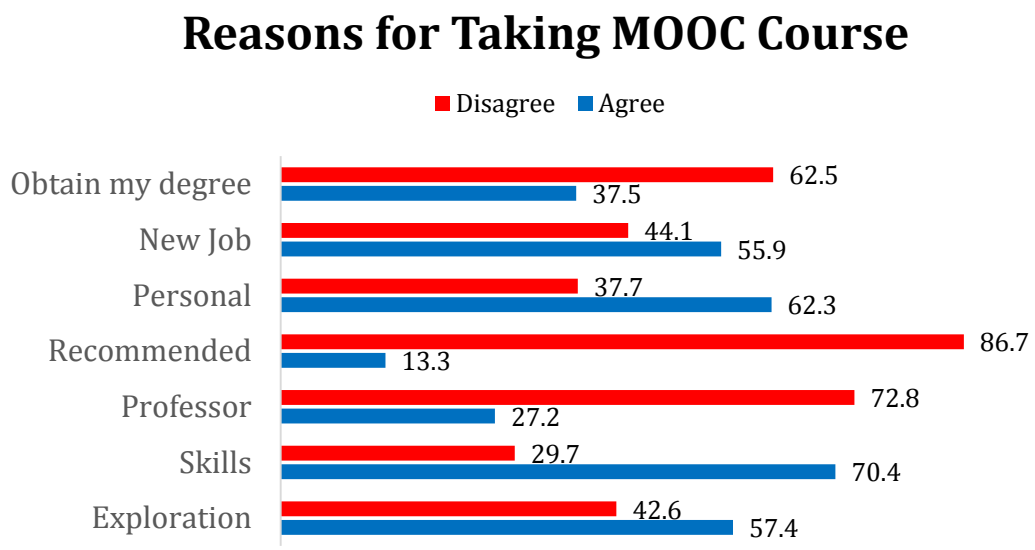

Figure 4. Reasons for taking the course.

Research Question 3

Do the following cultural indicators predict MOOC completion rates?

a. Communication

b. The ability of preforming learning tasks and activity in online environment (self-efficacy).

c. Comfort in working with a predominant Anglo-American context, and Western thought patterns.

d. Technology quality.

Five scales were selected to measure these cultural indicators. Factor analysis, reliability, and logistic regression were generated to answer question three.

Factors in Research

Exploratory factor analysis (EFA) of each factor in the instrument was generated. Exploratory factor analysis was used to "identify the factor structure or model for a set of variables" (Bandalos, 1996, p. 389). In social research, factor analysis is used for a

variety of purposes such as determining a theoretical construct that might underlie a certain data set, examining a method's effects, insuring how well scale items fit one construct, explaining variations among relevant variables, and addressing measure validity (Henson & Roberts, 2006).

Four scales were used to measure four factors: communication, technology, Anglo-America, and self-efficacy. After generating the EFA using SPSS, the communication, technology, and Anglo factor items were split into two components because they fit in different structures for a total of seven latent constructs.

1. Technology use: This factor contained four items and was labeled as Techno-use, which refers to how confident a person was when using technology for the course. Participants were asked questions using a 4-point Likert scale: 1 = *Strongly Disagree* and 4 = *Strongly Agree*. One item, "I feel the communication quality of the Internet," was recoded because it was negatively worded. Table 8 presents the analysis of the four scale items regarding technology use.

Table 8

Exploratory Factor Analysis and Internal Consistency for Technology Use

Items	Factor Loading	α
I feel the information technologies used in this course have good flexibility.	.795	.617
I feel the information technologies used in this course have many useful functions?	.791	
I feel the information technologies used in this course are very easy to use.	.721	
I feel the information technologies used in this course are easy to obtain.	.669	
I feel the communication quality of the Internet is not good.	.576	

2. Technology infrastructure: This factor contained three items and refers to the quality and the cost of the Internet network as a technology tool. Participants were asked questions using a 4-point Likert scale: 1 = *Strongly Disagree* and 4 = *Strongly Agree*. Table 9 presents the analysis of the three scale items relating to technology infrastructure.

Table 9

Exploratory Factor Analysis and Internal Consistency for Technology Infrastructure

Items	Factor Loading	α
I feel it is easy to go on-line.	.818	.571
I feel satisfied with the speed of the Internet?	.789	
My cost for the Internet usage is affordable	.839	

3. Communication disclosure: This factor contained seven items. Participants were asked questions using a 4-point Likert scale: 1 = *Strongly Disagree* and 4 = *Strongly Agree*. Individuals scoring a 4 reported they were less shy when communicating online; they were more comfortable and less embarrassed sharing personal information across online channels versus other media. However, a low score (1) meant individuals were shy, less comfortable, and more embarrassed when communicating online. Table 10 presents the analysis of the seven factor items relating to communication disclosure.

Table 10

Exploratory Factor Analysis and Internal Consistency for Communication Disclosure

Item	Factor Loading	α
I feel less shy when I am communicating online.	.793	.795
When online, I feel more comfortable disclosing personal information to a member of the opposite sex.	.735	
I feel like I can be more open when I am communicating online.	.735	
I feel like I can sometimes be more personal during Internet conversations.	.724	
I feel less embarrassed sharing personal information with another person online.	.721	
I feel less nervous when sharing personal information online.	.698	
It is easier to disclose personal information online.	.622	

4. Miscommunication: This factor contained five items. Participants were asked questions using a reverse 4-point Likert scale: 4 = *Strongly Agree* and 1 = *Strongly Disagree* since the items were negatively worded. Individuals scoring 4 on this factor indicated a belief that online communication inhibited mutual understanding and potentially generated negativity and conflict. Table 11 presents the analysis of the five factor items relating to miscommunication.

Table 11

Exploratory Factor Analysis and Internal Consistency for Miscommunication

Items	Factor Loading	α
Misunderstanding online can easily lead to conflict.	.709	.576
Miscommunication occurs frequently online.	.691	
When reviewing the class materials online, it is easy to take meanings that the instructor did not intend.	.662	
Sometimes people interpret online communication more negatively than the message sender intended.	.611	
When communicating online, lack of feedback from the other person, especially those from other cultural backgrounds, can lead to misunderstandings.	.360	

5. Self-efficacy: This factor consisted of five items. Participants were asked questions using a 4-point Likert scale: 1 = *Strongly Disagree* and 4 = *Strongly Agree*. Individuals who scored a 4 on this factor were confidant when learning course materials. Conversely, a score of 1 meant that individuals were less confident when learning course materials. Table 12 presents the analysis of the five factor items relating to self-efficacy.

Table 12

Exploratory Factor Analysis and Internal Consistency for Self- Efficacy

Items	Factor Loading	α
I am confident I can understand even the most difficult material presented in a self-paced, online course.	.833	.799
Even with challenges, I am confident I can learn the material presented online.	.811	
I am confident I can do an outstanding job on the activities in a self- paced, online course.	.794	
Even in the face of technical difficulties, I am certain I can learn the material presented in an online course	.662	
I am confident I can learn without the presence of an instructor to assist me.	.635	

6. Anglo-American Instructor: This factor consisted of two items. Participants were asked questions using a 4-point Likert scale: 1 = *Strongly Disagree* and 4 = *Strongly Agree*. Individuals scoring a 4 on this factor meant the teacher considered the students' cultural background during the course. A low score of one meant the teacher did not consider cultural backgrounds during the course. Table 13 presents the analysis of the two factor items relating to an Anglo-American instructor.

Table 13

Exploratory Factor Analysis and Internal Consistency for Anglo-American Instructor

Items	Factor Loading	α
I think the instructor is aware of differences in cultures in his/her online groups.	.844	.673
I think the instructor is taking into consideration my cultural background to make learning relevant to my cultural context (in activities or assignments)	.722	

7. Anglo experience: This factor consisted of four items. Participants were asked questions using a 4-point Likert scale: 1 = *Strongly Disagree* and 4 = *Strongly Agree*. However, two items were reverse coded: 4 = 1, 3 = 2, 2 = 3, and 1= 4 because they were negatively worded. Individuals scoring a 4 meant they had a good experience based on their cultural background. However, a low score meant they had an unsuccessful experience based on their cultural background. Table 14 presents the analysis of the four factor items relating to an Anglo experience.

Table 14

Exploratory Factor Analysis and Internal Consistency for an Anglo Experience

Items	Factor Loading	α
I feel motivated to participate in this class discussion because the instructor considered my cultural upbringing.	.674	.747
I have been informed by the instructor about the differences I may experience in taking a course based in a culture different than mine.	.691	
I have had an experience in this online classroom when I felt silenced because of any cultural reason	-.798	
I felt alienated or put aside in this online classroom because of my culturally based points of view.	-.798	

Table 15 shows the correlation coefficient off all addressed independent variables in question three. Correlation coefficient is a measure of strength and direction of the relationship between two variables. The results of the correlation coefficient indicated Anglo-experience, disclosure, and technology use were significantly correlated with technology infrastructure at the 0.05 level. Moreover, Anglo-experience and self-efficacy were significantly correlated with technology use at the 0.05 level. Also Anglo-experience and self-efficacy were significantly correlated with Anglo teacher. To further investigate whether these significant correlations caused any problems in terms of multicollinearity among the independent variables, a variance inflation factor (VIF) analysis was conducted. Multicollinearity might affect the overall result of the regression model and might lead to the increased likelihood of Type II errors, which is a failure to reject the null hypothesis (Mason & Perreault, 1991). The VIF assesses how much

multicollinearity existed in the regression model. Even though some of the independent variables were significantly correlated with each other, the result of the VIF indicated no significant collinearity existed among all the independent variables (see Table 16).

Table 15

Correlation Coefficient Between Independent Variables Addressed in Question Three

Variables	1	2	3	4	5	6	7
1- Technology Infrastructure	-						
2- Technology Use	.591**	-					
3- Anglo Teacher	.000	.155	-				
4- Anglo-experience	-.293**	-.190*	.476**	-			
5- Self-efficacy	.155	.331**	.290*	-.100	-		
6- Miscomm	-.117	-.091	.106	.098	.002	-	
7- Disclosure	-.274**	-.129	.025	.338*	-.168	-.024	-

*. Correlation is significant at the 0.05 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed).

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Table 16

Collinearity Statistics

Independent variables	VIF
Self- efficacy	1.275
Miscommunication	1.043
Disclosure	1.272
Technology-infrastructure	1.866
Technology use	1.987
Anglo-teacher	1.503
Anglo-experience	1.682

After a confirmatory factor analysis was conducted on the four factors, three of those factors were split into two factors for a total of seven variables. All the factors were normally distributed. The histograms in Figures 5-11 present the distribution for each factor.

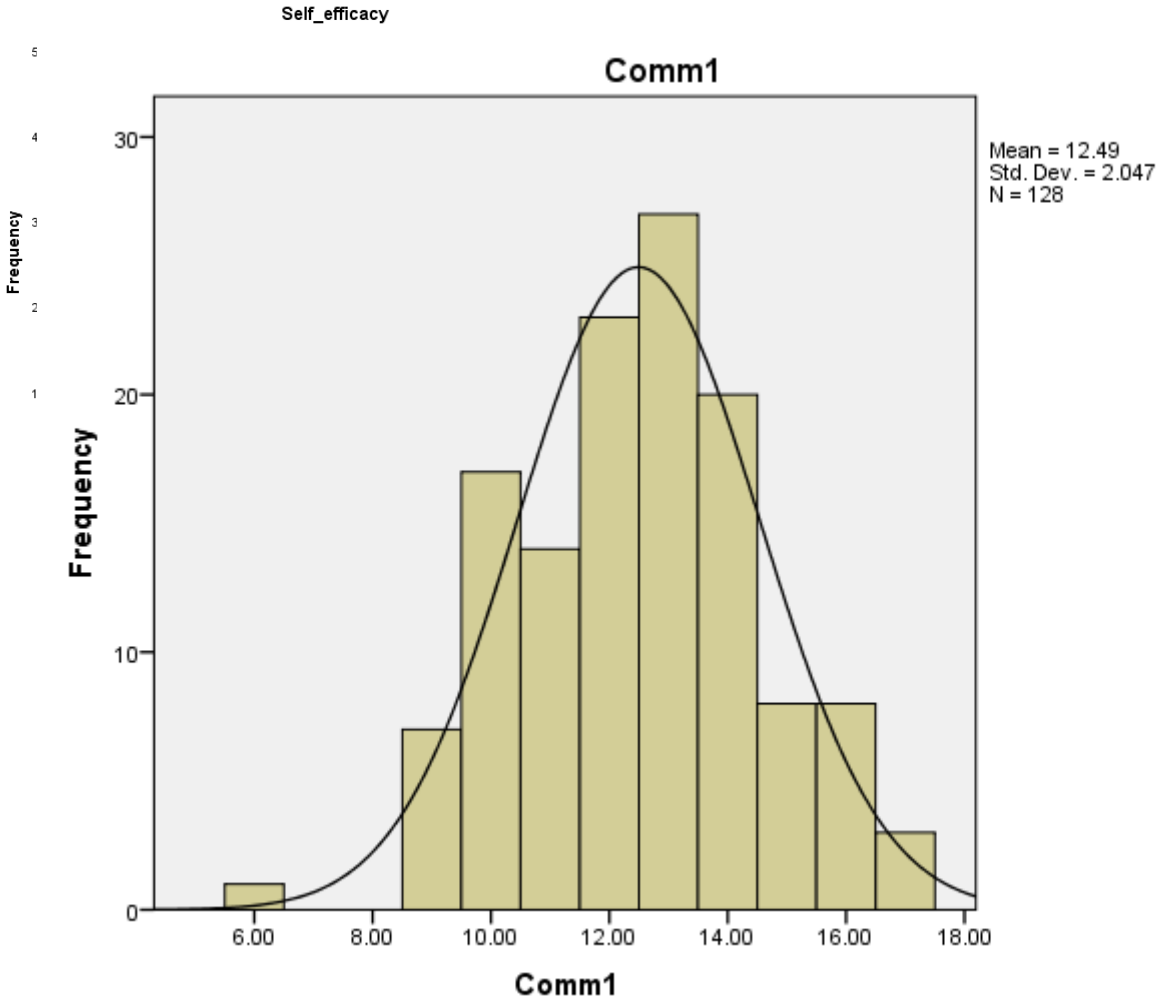

Figure 5. Distribution for the miscommunication variable.

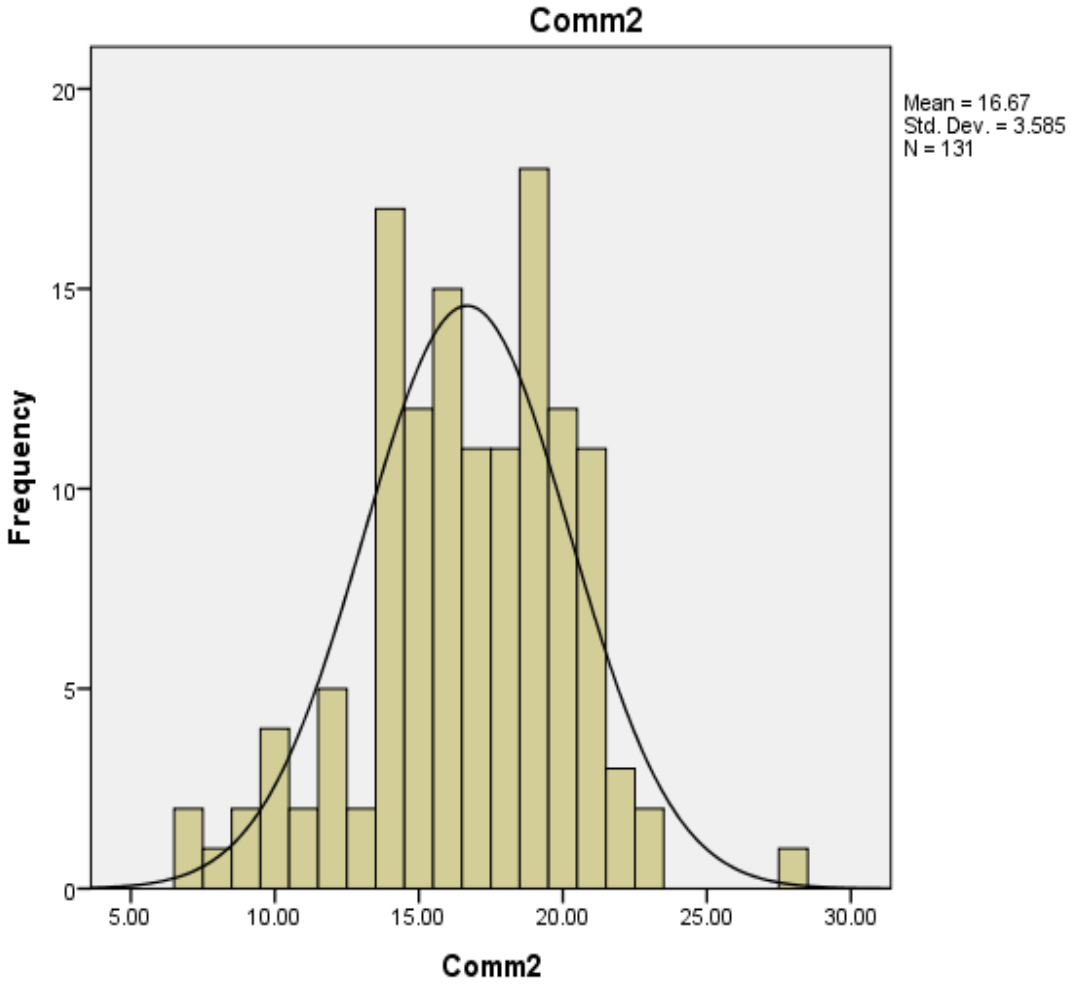

Figure 6. Distribution for the communication disclosure variable.

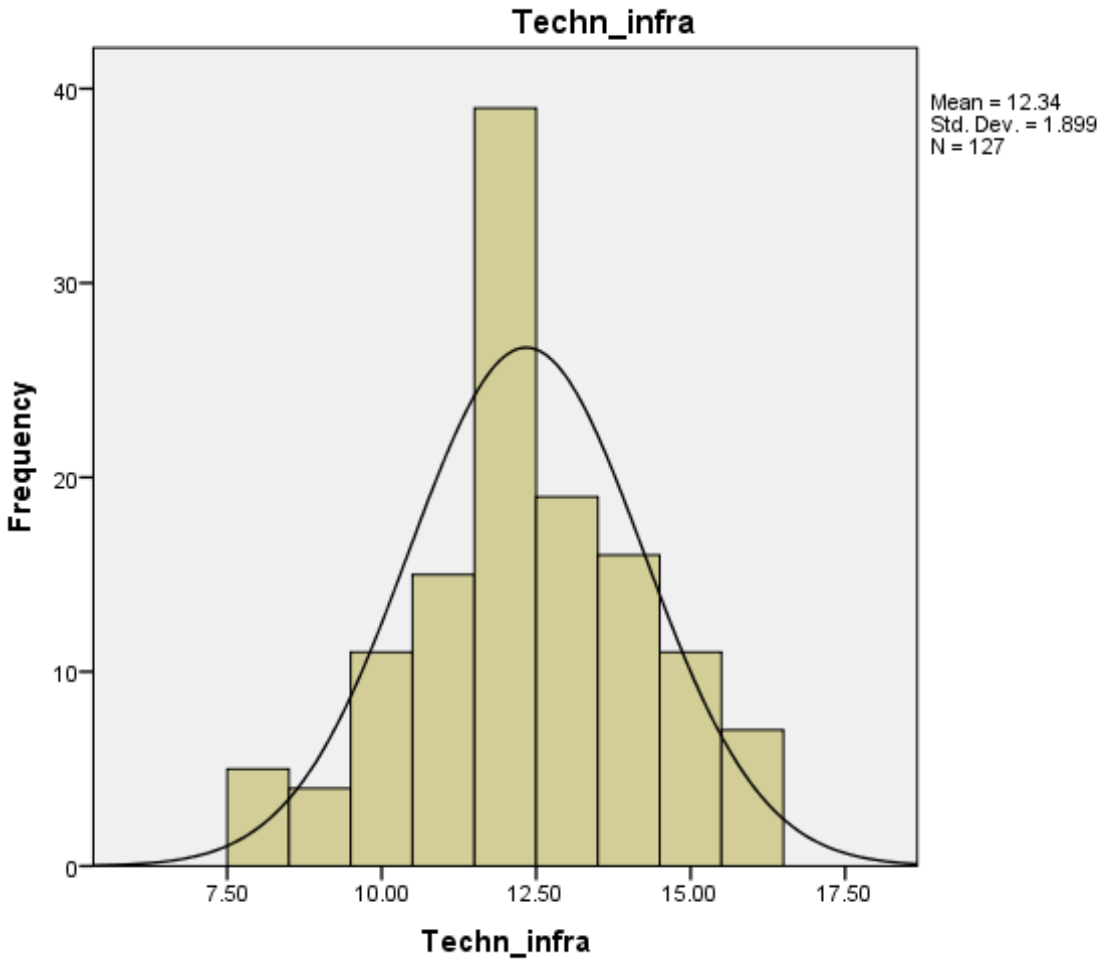

Figure 7. Distribution for the technology infrastructure variable.

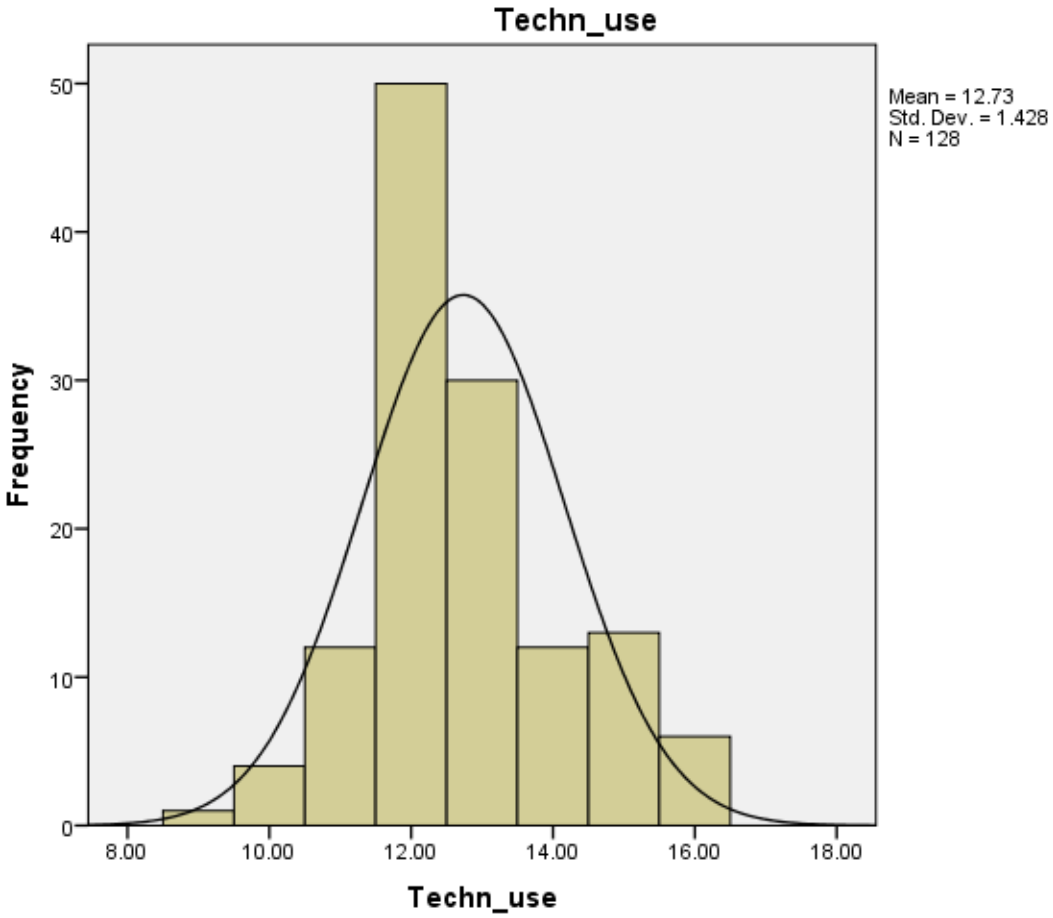

Figure 8. Distribution for the technology use variable.

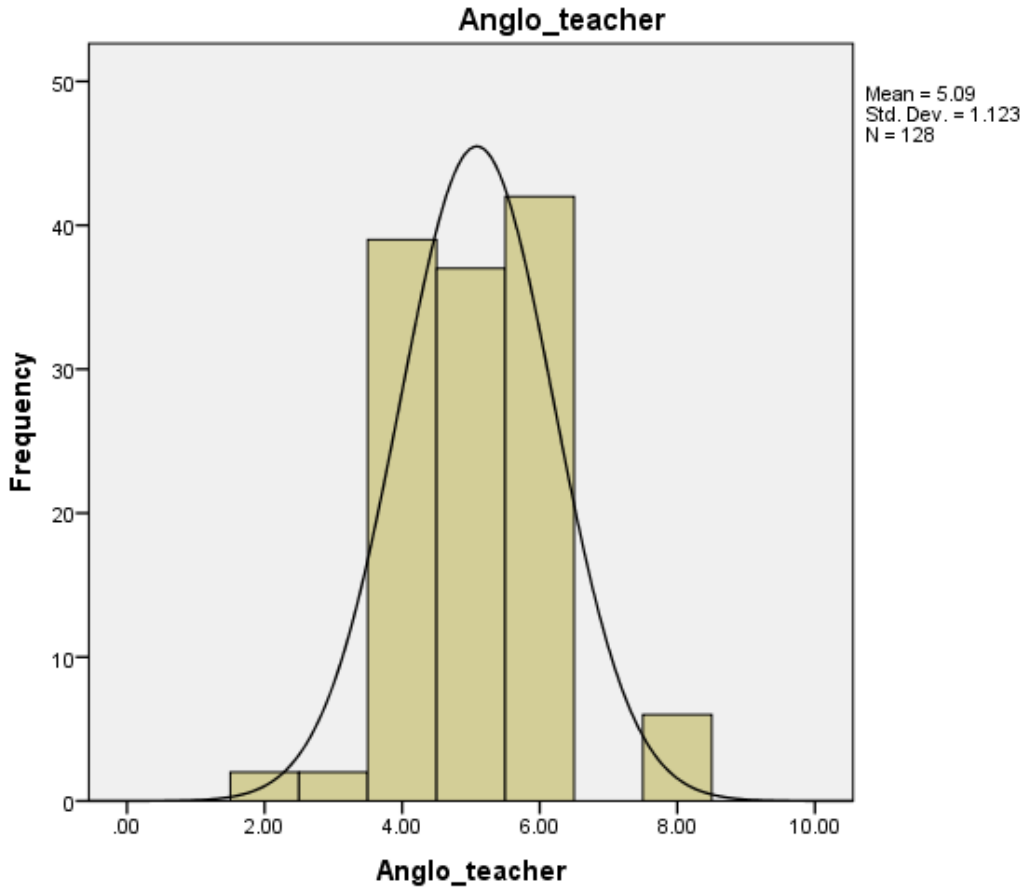

Figure 9. Distribution for the Anglo teacher variable.

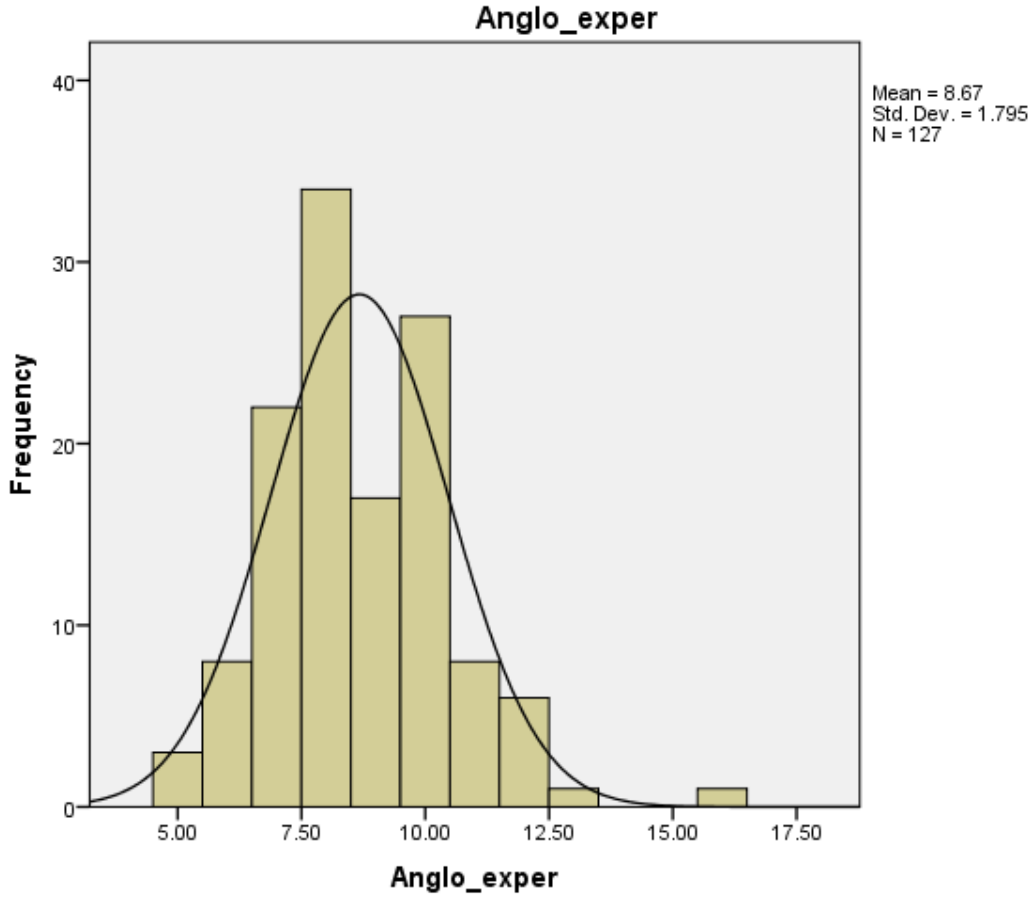

Figure 10. Distribution for the Anglo experience variable.

Thus, the third research question was reworded as follows based on the new changes in factor numbers.

Q3 Do the following cultural indicators predict MOOC completion rates?

a. Miscommunication

b. Self-disclosure

c. The ability of preforming learning tasks and activity in online environment (self-efficacy).

d. Comfort in working with a predominant of Anglo-American teacher

e. Comfort in working with a predominant patterns of Anglo-American patterns.

f. Technology use

g. Technology infrastructure

Statistical Analysis

A multivariate logistic regression model was used to answer the third research question. For this analysis, seven cultural indicators (miscommunication, self-disclosure, self-efficacy, Anglo-American teacher, Anglo-American experience, technology use, and technology infrastructure) were examined to determine whether these indictors predicted the likelihood of students' course completion. In this analysis, 133 student responses were included. The model was not statistically significant ($X^2(7) = 6.233$, $p > .05$) and was not able to distinguish between MOOC students who had completed and those who did not complete the course based on the cultural indicators. According to the results, the predictors explained 8% of variance in students' completion based on Cox and Snell R^2 and only explained 11% of the variance based on Nagelkerke R^2. Overall, none of the factors addressed on the model significantly predicted the likelihood of student completion. Table 17 shows the results for the model.

Table 17

Logistic Regression Estimates of Effect of Cultural Indicators on Student Completion of Massive Open Online Course

Variables	β	Exp β	*P*-Value
Self-Efficacy	-.047	.954	.644
Miscommunication	-.120	.887	.212
Communication Disclosure	-.085	.919	.164
Technology Infrastructure	-.169	.845	.230
Technology Use	.278	1.320	.148
Anglo Teacher	.048	1.049	.822
Anglo Experience	-.182	.834	.227

CHAPTER V

DISCUSSION

Introduction

This chapter discusses and analyzes the findings presented in Chapter IV. The discussion in this chapter is based on activity theory, the theoretical framework highlighted in Chapter I. Activity theory emphasizes the role of sociocultural factors in human learning activities. Community and tools are essential elements involved in human activities. According to activity theory, individuals must use a tool or instrument to reach an object. Moreover, human activity cannot be isolated from an individual's sociocultural environment. Individuals should understand their cultural means and society in order to reach an object. Activity theory stresses the role of the community or cultural environment in any human activity (Engeström, 1987). The researcher attempted to address the problem of this study utilizing activity theory to explore the role of culture in predicting massive open online course (MOOC) students' course completion.

Figure 11 mirrors the activity theory model in the MOOC activity. Students in a MOOC comprised the subjects in the model who used online tools such as Internet connections, computer devices, software programs, etc. as they worked toward their goal. However, these students were also influenced by the community and culture in reaching these goals; examples of these community and cultural influences were communication between students, between student and faculty, collaboration in online activities during

the course, their beliefs about their abilities, and sociocultural influences that shaped their behavior and attitudes. Whenever a community is involved, rules and conventions about roles and responsibilities govern the division of labor and collaboration efforts as members work to complete goals, reflecting a complex system of activity as represented by Engeström's (1987) model. Because cultural factors needed to be considered for students to successfully complete the course, Engeström's model for activity theory was useful in illustrating how these cultural influences factored into the model. This model was useful not only for the issues addressed in this study but could be helpful in understanding the complexity of the interaction of individuals with their community and culture as they engage in other tasks and venues such as shared collaboration on projects or research.

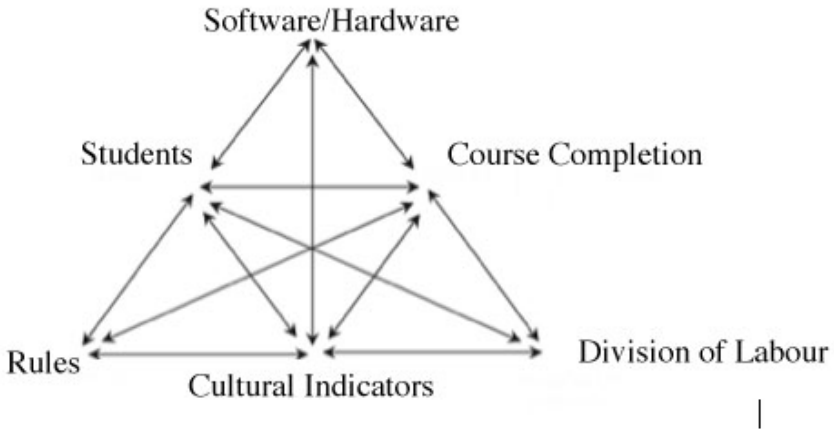

Figure 11. Activity theory model in the massive open online course.

Activity theory was a good fit in this study. This might be attributed to online and higher education addressing the problem of low completion rate in MOOC by reflecting on the contribution of activity theory. It is logical to examine how cultural indicators impact human activity. Examination of cultural indicators of MOOC phenomenon might provide insight about the course incompletion rate. To date, this has not yet been investigated. The following sections contain a detailed discussion concerning the results of this study, study limitations, and recommendations for further research.

Descriptive Statistics

In this study, participants were from 52 countries but the majority was from United States with 22 students. This was supported by Liyanagunawardena et al. (2013) who reported in their study that the large majority of MOOC students are from North America and Europe. Although various countries and cultural diversity were characterized by the students, less than five participants represented each country. Too much variation among the cultures based on the participants' countries caused "statistical noise" in the sample--an unexplained randomness found within a given data sample or formula. This could have been one of the issues that negatively affected the cultural indicators to predict MOOC students' completion.

The sample for this study was selected from two MOOC courses provided by a southwest American university during spring of 2015. Although based on a sample size recommended by the literature (133), it was not an adequate representative sample for MOOC students. In the literature, there was a debate about an appropriate sample size for the logistic regression model but there was no agreement about how to calculate it. Peng, Lee, and Ingersoll (2002) indicated there were no clear recommendations regarding

sample size requirements for logistic regression. They suggested if the number of subjects was at least 10 times larger than the number of independent variables, the sample size should be sufficient. This might indicate the sample size was not an issue in predicting MOOC students' completion using cultural indicators.

This study's sample consisted of 12% females and 88% males, which was supported by existing literature that MOOC students are predominantly male. In a study by Stein and Allione (2014), their sample was comprised of 64.4% males and only 35.6% females. Also, they found females were more likely to drop out of a MOOC course than were males. Other studies (Assan, Li, Ren, & Wen, 2013; Robinson et al., 2015) reported that there were significantly more males than females in their samples. This study's finding regarding gender differences among MOOC students was consistent with previous studies discussed in the literature review, indicating gender differences in the sample could have been another issue preventing the model from predicting MOOC students' completion. This may open up a new research avenue for future studies to investigate gender differences and completion rate in MOOC.

More non-native English speakers completed the course than did native English speakers. This might indicate other factors than language played a role in motivating students to complete the course. For instance, the majority of the sampled students had agreed to attend the course to develop their professionalism. This motivational reason might have encouraged these students to complete the course despite all other challenges including communication.

The majority of the students agreed they were utilizing MOOCs to improve their jobs. A study done by Qualtrics (2013) and its Instructure Partner found the second

primary motivator for MOOC students was professional development after the course topic. However, a majority of students disagreed they attended the course because they wanted to be in a certain professor's class. For instance, Stein and Allione (2014) reported in their study that students who were interested in attending a course with a certain professor were 30% more likely to drop out than those enrolled because they wanted to expand their knowledge. This might have led to other factors such as motivational reasoning for attending a MOOC, which could have predicted students' completion but was not addressed in this study.

Logistic Regression Analysis

All cultural indictors selected for this study were based on existing literature and activity theory. A surprising outcome of this study was the cultural indicators did not predict the completion rate of MOOC students. While factor analysis was conducted to assure the reliability of the factors selected in this study, some of these factors showed low reliability. These factors are discussed in more detail in the following section.

Factor Analysis

The histograms of all factors (see Chapter IV) showed normal distribution, indicating the assumptions of normality for these factors were met. However, technology infrastructure had a low reliability of .571. This factor was spilt from the technology factor during the exploratory factor analysis process, which might have resulted in the factor's low internal validity. Separation of the factor into two sub-factors might have led participants to misinterpret the items differently from what the author of the scale intended. This factor was selected as one of the cultural indicators based on the literature (Liyanagunawardena et al., 2013; Sun et al., 2008), which showed that MOOC students

from developing countries might suffer from conditions related to technology accessibility. Even though the results of the current study did not show statistical significance that technology predicted students' completion, the literature did show technology quality had an effect on students' outcomes. In the Qualtrics (2013) study, technical problems might have delayed learning, forcing students to drop out of the course.

Another factor that had low reliability was miscommunication with an alpha of .576. However, this factor was selected from an existing measure (Ledbetter, 2009) that had a reported high reliability of .86. Also, Ledbetter (2009) reported initial evidence for the robustness and concurrent validity of the measure. The low reliability of the factor in this study could have been because the subjects in the original study were only American individuals. International students comprised the majority of the subjects in the current study. However, the pilot of the current study had almost the same high reliability—a Cronbach's alpha of .806.

Other cultural factors selected for this study that addressed cultural indictors such as Anglo-American context, self-efficacy, and technology use had fairly high reliability. However, the low reliability of some factors discussed earlier might have prevented the model from predicting MOOC student's completion.

Correlation coefficients were computed between all the independent variables including Anglo-teacher, Anglo experience, self-efficacy, technology use, technology infrastructure, miscommunication, and disclosure to ensure there was no multicollinearity among these variables. The results indicated there was no association between these

variables. In other words, the overall results were not affected by a correlation between any of these variables.

The Overall Result

Based on the results of the logistic regression model, no statistical significance was found. However, the Anglo experience and technology use factors showed stronger significance compared to other factors. Perhaps these factors were more relevant cultural indicators compared to the other factors. It is reasonable to expect that if students coming from a different culture are more comfortable with the Anglo experience found in an Anglo dominated course, they would be more likely to complete the course. Whereas if students from other cultures are less comfortable with how the class is provided, they will be less likely to complete the course.

Another factor that had a strong Beta distribution was technology use. This factor suggested when MOOC students are confident using the technology tools required by the course, this might predict a higher possibility of completion. In other words, MOOC students from developing countries might not complete the course if they are less comfortable with the technology tools necessary for the course. The results of these two factors as statistical significant predictors might have been different if a larger representative sample was utilized. Since there has been no clear agreement about the appropriate sample size for logistic regression, the sample size used in this study could have affected the results.

Limitations

Since there was no clear answer to the debate about the adequate sample size necessary for research, the sample size ($N = 133$) of this study could be considered a

major limitation. Having a larger sample size would have provided stronger results for the logistic regression method. In addition, the sample was limited to two MOOC courses provided by the same university. Data collected from more courses provided by more universities could provide a larger, more comprehensive sample.

In addition, the sample for this study was comprised of more males than females, which might have created a gender bias. It is important to account for this possible gender bias when considering the failure of the model to predict MOOC student completion rate. Men and women might experience culture differently and respond to cultural indicators in different ways. Another limitation was too much cultural variation in this study because although there were respondents from 52 countries, fewer than five participants were from most of the countries outside the United States. Cultural diversity is needed since not enough individual participants represented the various countries. This might have led to "noise" in the sample.

Another limitation might have been the two month time lag from when participants had completed the course to the data collection period. This meant the participants were relying on remembering what they experienced utilizing self-reported measures, which might have affected the reliability of the study. Data might have been more reliable if they had been collected at the time of the MOOC completion. Another limitation could have been the instrument used. Another instrument might have better measured these cultural indicators. In addition, more appropriate cultural indicators could be measured than the ones addressed in this study.

A final limitation of the study was the type of data collected. This study used only quantitative data. Using qualitative data in addition to the quantitative data would

have provided more in-depth information about the individual experiences of MOOC students and addressed the MOOC completion issue. Even with the limitations of the study mentioned here, the study addressed a trend in the field of distance learning in higher education and highlighted the important issue of MOOC completion rates.

Recommendations for Future Research

Higher education will most likely continue to use MOOCs as one aspect of e-learning. More research needs to be conducted to help course designers and instructors understand how cultural diversity might affect completion rates. Even though no significant results were found in this study, this researcher can provide recommendations for further research. Other cultural indicators than the ones selected for this study might influence MOOC students' completion. Demographic information such as country of origin and language could be used as predictors for student completion in further research. Additional research on cultural indicators could provide more information to improve the problem of high dropout rates of MOOC students.

Future studies might limit the sample to international students only. Since the majority of the MOOC students are American, limiting them from the sampling and only investigating cultural issues among international students could show different results.

Since the results of this study were based on quantitative data, future studies might want to use additional qualitative methods for more detailed information on students' completion. Although the instrument used in this study was mostly reliable and valid, future studies could utilize a better instrument to address the cultural indicators selected in this dissertation, which might change the results.

Conclusion

This dissertation investigated the problem of high dropout rates in MOOCs. More specifically, it addressed the cultural indicators of communication, technology, self-efficacy, and Anglo American context to predict MOOC students' completion. This study has contributed to higher education and filled a research gap in addressing cultural issues and MOOC completion rate. Exploring the phenomena of cultural aspects in MOOC has created a new research avenue to explore other cultural issues beyond what was addressed in this dissertation. As discussed earlier, MOOC is a new trend in the field of the higher education and distance learning. More research could explore issues related to low completion rates of MOOC students . The head of marketing at Qualtrics (2013), Danielle Wanderer, stated, "Until now, research on MOOCs has been limited to asking faculty and administrators what they think about open online learning but little has been done to explore what students are thinking" (para. 1). This confirms that many factors related to MOOC students should be explored, which might lead to solving the problem of low completion rates. In the current dissertation, the researcher attempted to address issues related to cultural aspects. Moreover, since MOOCs are considered one of the more recent innovations in higher education, future researchers might need to explore factors related to other issues beyond the one selected by this researcher.

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APPENDIX A

THE NETWORKED READINESS INDEX

The Networked Readiness Index 2014

Rank	Country/Economy	Value	2013 rank (out of 144)
1	Finland	6.04	1
2	Singapore	5.97	2
3	Sweden	5.93	3
4	Netherlands	5.79	4
5	Norway	5.70	5
6	Switzerland	5.62	6
7	United States	5.61	9
8	Hong Kong SAR	5.60	14
9	United Kingdom	5.54	7
10	Korea, Rep.	5.54	11
11	Luxembourg	5.53	16
12	Germany	5.50	13
13	Denmark	5.50	8
14	Taiwan, China	5.47	10
15	Israel	5.42	15
16	Japan	5.41	21
17	Canada	5.41	12
18	Australia	5.40	18
19	Iceland	5.30	17
20	New Zealand	5.27	20
21	Estonia	5.27	22
22	Austria	5.26	19
23	Qatar	5.22	23
24	United Arab Emirates	5.20	25
25	France	5.09	26
26	Ireland	5.07	27
27	Belgium	5.06	24
28	Malta	4.96	28
29	Bahrain	4.86	29
30	Malaysia	4.83	30
31	Lithuania	4.78	32
32	Saudi Arabia	4.78	31
33	Portugal	4.73	33
34	Spain	4.69	38
35	Chile	4.61	34
36	Slovenia	4.60	37
37	Cyprus	4.60	35
38	Kazakhstan	4.58	43
39	Latvia	4.58	41
40	Oman	4.56	40
41	Puerto Rico	4.54	36
42	Czech Republic	4.49	42
43	Panama	4.36	46
44	Jordan	4.36	47
45	Brunei Darussalam	4.34	57
46	Croatia	4.34	51
47	Hungary	4.32	44
48	Mauritius	4.31	55
49	Azerbaijan	4.31	56
50	Russian Federation	4.30	54
51	Turkey	4.30	45
52	Montenegro	4.27	48
53	Costa Rica	4.25	53
54	Poland	4.24	49
55	Barbados	4.22	39
56	Uruguay	4.22	52
57	Macedonia, FYR	4.19	67
58	Italy	4.18	50
59	Slovak Republic	4.12	61
60	Georgia	4.09	65
61	Mongolia	4.07	59
62	China	4.05	58
63	Colombia	4.05	66
64	Indonesia	4.04	76
65	Armenia	4.03	82
66	Seychelles	4.02	79
67	Thailand	4.01	74
68	Bosnia and Herzegovina	3.99	78
69	Brazil	3.98	60
70	South Africa	3.98	70
71	Trinidad and Tobago	3.97	72
72	Kuwait	3.96	62
73	Bulgaria	3.96	71
74	Greece	3.95	64
75	Romania	3.95	75
76	Sri Lanka	3.94	69
77	Moldova	3.89	77
78	Philippines	3.89	86
79	Mexico	3.89	63
80	Serbia	3.88	87
81	Ukraine	3.87	73
82	Ecuador	3.85	91
83	India	3.85	68
84	Vietnam	3.84	84
85	Rwanda	3.78	88
86	Jamaica	3.77	85
87	Tunisia	3.77	n/a
88	Guyana	3.77	100
89	Cape Verde	3.73	81
90	Peru	3.73	103
91	Egypt	3.71	80
92	Kenya	3.71	92
93	Dominican Republic	3.69	90
94	Bhutan	3.68	n/a
95	Albania	3.66	83
96	Ghana	3.65	95
97	Lebanon	3.64	94
98	El Salvador	3.63	93
99	Morocco	3.61	89
100	Argentina	3.53	99
101	Guatemala	3.52	102
102	Paraguay	3.47	104
103	Botswana	3.43	96
104	Iran, Islamic Rep.	3.42	101
105	Namibia	3.41	111
106	Venezuela	3.39	108
107	Gambia, The	3.38	98
108	Cambodia	3.36	106
109	Lao PDR	3.34	n/a
110	Zambia	3.34	115
111	Pakistan	3.33	105
112	Nigeria	3.31	113
113	Suriname	3.30	117
114	Senegal	3.30	107
115	Uganda	3.25	110
116	Honduras	3.24	109
117	Zimbabwe	3.24	116
118	Kyrgyz Republic	3.22	118
119	Bangladesh	3.21	114
120	Bolivia	3.21	119
121	Liberia	3.19	97
122	Côte d'Ivoire	3.14	120
123	Nepal	3.09	126
124	Nicaragua	3.08	125
125	Tanzania	3.04	127
126	Swaziland	3.00	136
127	Mali	3.00	122
128	Gabon	2.98	121
129	Algeria	2.98	131
130	Ethiopia	2.95	128
131	Cameroon	2.94	124
132	Malawi	2.90	129
133	Lesotho	2.88	138
134	Sierra Leone	2.85	143
135	Benin	2.82	123
136	Burkina Faso	2.78	130
137	Mozambique	2.77	133
138	Libya	2.75	132
139	Madagascar	2.74	137
140	Yemen	2.73	139
141	Timor-Leste	2.69	134
142	Mauritania	2.61	135
143	Haiti	2.52	141
144	Angola	2.52	n/a
145	Guinea	2.48	140
146	Myanmar	2.35	n/a
147	Burundi	2.31	144
148	Chad	2.22	142

APPENDIX B

VALUES OF HOFSTEDE'S CULTURAL INDICES

VALUES OF HOFSTEDE'S CULTURAL INDICES FOR 40 COUNTRIES

Country	Power [1] Distance	Uncertainty [2] Avoidance	Individualism [3] Collectivism	Masculinity [4] Femininity	Confucian Dynamism
Argentina	49	86	46	56	
Australia	36	51	90	61	31
Austria	11	70	55	79	
Belgium	65	94	75	54	23
Canada	39	48	80	52	
Chile	63	86	23	28	
Colombia	67	80	13	64	
Denmark	18	23	74	16	
Finland	33	59	63	26	
France	68	86	71	43	
Great Britain	35	35	89	66	25
Germany (F.R.)	35	65	67	66	31
Greece	60	112	35	57	
Hong Kong	68	29	25	57	96
India	77	40	48	56	
Iran	58	59	41	43	
Ireland	28	35	70	68	
Israel	13	81	54	47	
Italy	50	75	76	70	
Japan	54	92	46	95	80
Mexico	81	82	30	69	44
Netherlands	38	53	80	14	
Norway	31	50	69	8	
New Zealand	22	49	79	58	30
Pakistan	55	70	14	50	0
Peru	64	87	16	42	
Philippines	94	44	32	64	19
Portugal	63	104	27	31	
South Africa	49	49	65	63	
Singapore	74	8	20	48	48
Spain	57	86	51	42	
Sweden	31	29	71	5	33
Switzerland	34	58	68	70	
Taiwan	58	69	17	45	87
Thailand	64	64	20	34	56
Turkey	66	85	37	45	
U.S.A.	40	46	91	62	29
Venezuela	81	76	12	73	
Yugoslavia	76	88	27	21	
Mean	52	65	50	50	
Std. Deviation	20	24	25	20	
Range	11-104	8-112	12-91	5-95	

APPENDIX C

SURVEY

Reasons for taking this course

	Strongly Disagree	Disagree	Agree	Strongly Agree
I enrolled in this course to explore the Massive Open Online Course.	○	○	○	○
I enrolled in this course Gain specific skills to do my job better.	○	○	○	○
I enrolled in this course to be in this particular professor class.	○	○	○	○
I enrolled in this course because someone I know recommended this course to me.	○	○	○	○
I enrolled in this course just to try it out for fun.	○	○	○	○
I enrolled in this course to gain specific skills to get a new job.	○	○	○	○
I enrolled in this course to gain knowledge to obtain my degree.	○	○	○	○

Is English your primary language?

○ Yes

○ No

Communication

	Strongly Disagree	Disagree	Agree	Strongly Agree
Sometimes people interpret online communication more negatively than the message sender intended	○	○	○	○
When communicating online, lack of feedback from the other person, especially those from other cultural backgrounds, can lead to misunderstandings.	○	○	○	○
When reviewing the class materials online, it is easy to take meanings that the instructor did not intend.	○	○	○	○
Misunderstanding online can easily lead to conflict.	○	○	○	○
Miscommunication occurs frequently online.	○	○	○	○
It is easier to disclose personal information online.	○	○	○	○
I feel like I can be more open when I am communicating online.	○	○	○	○
I feel less shy when I am communicating online.	○	○	○	○
I feel less nervous when sharing personal information online.	○	○	○	○
I feel less embarrassed sharing personal information with another person online.	○	○	○	○
I feel like I can sometimes be more personal during Internet conversations.	○	○	○	○
When online, I feel more comfortable disclosing personal information to a member of the opposite sex.	○	○	○	○

Self Efficacy and Competencies

	Strongly Disagree	Disagree	Agree	Strongly Agree
I am confident I can learn without the presence of an instructor to assist me.				
I am confident I can understand even the most difficult material presented in a self-paced, online course.				
I am confident I can do an outstanding job on the activities in a self- paced, online course.				
Even with challenges, I am confident I can learn the material presented online.				
Even in the face of technical difficulties, I am certain I can learn the material presented in an online course.				

Quality of Technological Components

	Strongly Disagree	Disagree	Agree	Strongly Agree
I feel the information technologies used in this course are very easy to use.				
I feel the information technologies used in this course have many useful functions.				
I feel the information technologies used in this course have good flexibility.				
I feel the information technologies used in this course are easy to obtain.				
I feel satisfied with the speed of the Internet.				
I feel the communication quality of the Internet is not good.				
I feel the fee to connect to the Internet is very expensive.				
I feel it is easy to go on-line.				

Anglo-American context

	Strongly Disagree	Disagree	Agree	Strongly Agree
I think the instructor is aware of differences in cultures in his/her online groups.				
I think the instructor is taking into consideration my cultural background to make learning relevant to my cultural context (in activities or assignments)				
I been informed by the instructor about the differences I may experience in taking a course based in a culture different than mine.				
I have had an experience in this online classroom when				
I felt silenced because of any cultural reason.				
I felt alienated or put aside in this online classroom because of my culturally based points of view.				
I feel motivated to participate in this class discussion because the instructor considered my cultural upbringing.				

What is your gender?

- Male
- Female

What is your country of origin?

What is your current education status?

- Full-time student
- part-time student
- Not a student

What is your highest educational level

- Doctorate degree
- Professional school degree
- Master's degree
- Bachelor'sdegree
- Associate degree
- Some collage but no degree
- High school diploma
- Some high school
- Some primary or elementary school
- No schooling completing

What is your current employment status?

- Employed full-time
- Employed part-time
- Un employed and looking for work
- Un employed and not looking for work
- Other

APPENDIX D

INSTITUTIONAL REVIEW BOARD APPROVAL

UNIVERSITY of NORTHERN COLORADO

Institutional Review Board

DATE:	November 6, 2014
TO:	Fatma Alabdullaziz, PhD
FROM:	University of Northern Colorado (UNCO) IRB
PROJECT TITLE:	[669944-3] Pilot Study of Cultural Diversity in MOOC: The Correlation Between Cultural Indicators and Students' Attrition
SUBMISSION TYPE:	Amendment/Modification
ACTION:	APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE:	November 3, 2014

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

Hello Fatma,

Good work and you are now approved to conduct your research. Good luck with the study.

Sincerely,

Nancy White, PhD, IRB Co-Chair

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Sherry May at 970-351-1910 or Sherry.May@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.