PERCEPTIONS OF FACULTY AND INSTRUCTIONAL DESIGNERS ON MULTICULTURAL LEARNERS' NEEDS IN MASSIVE OPEN ONLINE COURSES

A Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Philosophy

by

Trang Phan

August 2016

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Abstract

Massive Open Online Courses (MOOCs) are one of the most innovative forms of online instruction delivered to learners of different language, cultural and educational backgrounds around the world. These multicultural learners have diverse communication styles, learning behaviors and needs that are manifested and demonstrated differently in such a large scale online learning environment as MOOCs. There is little research on how aspects of MOOC learners’ diverse cultural backgrounds and learning behaviors are perceived, how these learners are characterized in terms of their learning needs, and how the MOOC instructors and instructional designers respond to these needs in the course design process.

The purpose of this qualitative study was to describe how MOOC learners’ diverse learning needs, stemming from their different language, cultural and educational backgrounds, were perceived and responded to during the course design and delivery. Participants were fifteen instructors and instructional designers in American higher educational institutions who were involved in designing and delivering a wide variety of MOOC subjects on the Coursera hosting platform. The insights of participants into specific instructional strategies that were designed especially for MOOC multicultural learners’ needs were categorized into three themes: language, content and engagement. These strategies aimed to provide support and engage learners with English language barriers, who did not have the necessary subject background, or who were not familiar

with the culture of American education. The study also investigated the pedagogical challenges and concerns that the participants faced during and after the delivery of the MOOCs. Typical challenges included confusions caused during the discussion triggered by the subject, the participants' struggle with the efficiency of peer assessment, and the applicability of the content materials for the global audience.

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Chapter I

Introduction

Culture is central to learning and essential in communicating, information seeking and in shaping individual and group thinking processes (Ladson-Bilings, 1994). A pedagogy that acknowledges, responds to and embraces knowledge and insights from different cultural groups provides fuller access to education and makes it more appealing (Gay, 2000; Nieto, 1999). Culturally responsive teaching accounts for Gay's (2000) phenomenal work with the rationale that knowledge and skills are best perceived when they are situated in a way that is personally meaningful to the students. That is, the academic achievement of these culturally diverse students will be significantly improved if the knowledge is filtered through their own cultural experience (Au & Kawakami, 1994; Foster, 1995; Gay, 2000; Hollins, 1996; Kleinfeld, 1975; Ladson-Billings, 1994, 1995).

Designing and teaching courses for a culturally diverse student population provides both challenges and rewards (Fine & Handelsman, 2010) and becomes critically important in all levels of education, especially in this fast-paced, multicultural society. Students who speak English as a second language may face several natural disadvantages, such as their English vocabulary being less extensive than their classmates', their having difficulty understanding and speaking idiomatic language, or their following the fast speech that characterizes American class discussion. These disadvantages might hinder the development of their oral skills and could single them out from the classroom community.

Cultural differences influence student academic performance in addition to language problems. Asian student learning styles are memorization-based with little focus on argument making and critical thinking development or questioning their teachers (Wong, 2004). These students are taught not to challenge the teacher in the class because that is a sign of disrespect. In the classroom that involves international students, the instructor needs to be cautious about asking them to criticize other students' viewpoint, and especially the teacher's.

On the other hand, teaching students from a variety of backgrounds provides huge instructional opportunities because of the rich inputs brought by a variety of students. Diversity of students' experience, age, religion, race, ethnicity, gender and many other attributes contributes to the richness of the teaching and learning environment (Fine & Handelsman, 2010). Instructors can build integrated lessons that invite the examination of the subject from multiple perspectives, allow students to synthesize their knowledge through interdisciplinary group work, and require them to evaluate their ability to view a topic from multiple angles. In order to overcome the challenges and accomplish the benefits, the instructor needs to do rigorous pre-instructional planning, be acquainted with the materials from other disciplines, explain to the students the approach being used and deliver the content in a coherent manner so that the students can see how topic areas are connected. Course planning must take into account the language and cultural diversity among the student body (McLoughlin, 2007).

Acknowledging students' culturally diverse backgrounds is manifested very differently in an online learning environment. Virtual interaction with the students in an online learning environment precludes the normal non-verbal communication that

characterizes the traditional classroom. For example, a learned non-verbal behavior like a wink or an innate one such as a blush can give the instructor a cue that the student feels uncomfortable but is not able to express it directly (Thompson, 1973). Such cues are not evident in a virtual classroom. Nonetheless, nonverbal behaviors have universal meaning, though many of them are culturally varied. For example, the nonverbal act of looking directly into somebody's eye during a conversation is culturally based. In Asian culture, it is a sign of disrespect to make direct eye contact with a person of higher social status (Suinn, 2006). In Arabian cultures, individuals tend to gaze more directly in conversations and for a longer periods than other cultures (Matsumoto, 2006). The presence of these cues may or may not produce an effect in a face-to-face classroom, but they do not exist in an online classroom. In a large scale online learning environment such as a MOOC, the learner population multiplies in size and may be much more culturally diverse as compared to a conventional online course. The need to understand students' multicultural backgrounds that influence learning needs and behaviors is therefore both great and urgent.

Massive Open Online Courses (MOOCs) are web-based online courses offered for learners around the world regardless of their age, race, social or educational status. MOOC learners are offered access to learning resources and opportunities without admission requirements and generally at little to no cost. Thus, MOOCs are considered to be a means to democratize education by serving underserved populations (learners with low income) (Wulf, Brenner, & Leimeister, 2014). As an example, in the two MOOCs *Powerful Tools for Teaching and Learning: Digital Storytelling* and *Powerful Tools for Teaching and Learning: Web 2.0.* offered by the College of Education at the University

of Houston, the underserved groups accounted for 37% and 43% of the total participants respectably. Because of their accessibility, MOOCs enhance learner diversity by welcoming learners from emerging economies which in turn enriches a university's offerings to the community.

Hence, in order to reach the goals of embracing diversity, improving campus-based programs and enriching the university's offerings to the community, instructors need to understand and acknowledge diversity among the learners, and institutions must understand how to support faculty in achieving high quality pedagogical design of MOOCs. Such design must take into consideration the many different aspects of MOOC learners' diversity and their various learning needs. Given the absence of physical interaction and the knowledge of the learners' background found in a conventional face-to-face or online learning environment, how is the identification of and response to the diverse learners' needs manifested during the design phase of a MOOC? To what extent can strategies used in a traditional multicultural classroom be applied and modified in a massive open online learning environment?

Reason for Choosing the Topic

During the first days of assisting in the design of the aforementioned MOOCs in the College of Education at the University of Houston, I realized there was so much unknown about the learners for whom the MOOCs were intended. The design team started without any basic demographic information about the learners, such as their country of origin, native language, educational background, and employment status. Nor did the team have more in-depth information, such as how the learners might respond to and interact with the course content that was being designed for them. Not knowing who

the audience would be, we didn't know how any of the above factors might affect their learning behaviors in our MOOCs or what their motivations and expectations from the courses might be. Due to the lack of insight into these factors, our design plans for the courses were fluid in structure from the beginning, and the design of the course materials went through multiple revisions. One strategy we used was each team member signed up to explore a particular MOOC on the hosting platform of Coursera and to uncover its design insights and instructional philosophy by being a student. In another strategy, we mapped out possible enrollment of our potential learners and planned the course content based on these speculated subgroups. While we realized that these strategies were a great help in designing the MOOCs, they were, nonetheless, conjecture.

I began to ponder how MOOCs were designed in other American higher education institutions. I wondered if the MOOC instructors and instructional designers had gone through similar conjectural processes as we did in our institution, and if so, what their design processes looked like. A few questions that came to mind were: *What did MOOC instructors and designers in other institutions understand about the multicultural backgrounds of their learners? What might be a good approach to predict the learner's needs? To what extent did the MOOC instructors and instructional designers consider possible strategies to address those needs?* Being increasingly intrigued by the widely varying potential answers for these questions, I formed my research topic: to explore MOOC instructors' and instructional designers' perceptions of their MOOC learners' diverse backgrounds and needs; how these perceptions would manifest in their MOOC designs and influence the choice of instructional strategies uses to address those needs; and possible difficulties they might face in doing so.

Purpose and Nature of the Study

This study explored perceptions of MOOC instructors and designers regarding the multicultural learners in these courses, their learning needs and behaviors and how these perceptions were manifested during the design phase. It also examined different instructional strategies that MOOC instructors and instructional designers used to respond to the learners' needs in the MOOC learning environment and pedagogical challenges they faced when designing the MOOCs for tens or hundreds of thousands of students across the globe. This qualitative study sought the answers to the above questions through different sources of data, such as recollections of the learners' demographic provided by the MOOC instructors and designers participating in the research, course content data of the investigated MOOCs conducted by the researcher, and other data sources from interviews with MOOC instructors and designers.

Current issues on MOOC research include the influence of MOOCs on the future of higher education (Billington & Fronmuller, 2013), the effects of MOOCs on learning and teaching (Martin, 2012), the educational problems MOOCs might solve (Rivard, 2013), the gaps in MOOC research (Liyanagunawardena, Adams & Williams, 2013), and the blending of face-to-face classes with online MOOC classes (Bruff, Fisher, McEwen, & Smith, 2013). This study proposed a new research agenda focusing on: 1) insights into learners' behaviors and needs as determined by their multicultural backgrounds by MOOC instructors and instructional designers; 2) responses to the identified needs during MOOC design and development; and 3) possible pedagogical challenges identified by the instructors and instructional designers when attempting to respond to the needs. There are two original contributions of this study to MOOC instructors and course designers. First,

it provides a set of resources on profiles of global MOOC learners and their learning behaviors. Second, it suggests pedagogical lessons, including instructional strategies used to respond to the needs and pedagogical challenges encountered when doing so, which can be used by the next generation of MOOC instructors and designers. These lessons could also be applied to traditional online and face-to-face courses that involve a diverse group of multicultural learners.

Research Questions

This research study explored MOOC instructors' and instructional designers' perceptions of their multicultural learners and how they translated those perceptions into their MOOC design, as well as possible pedagogical challenges they faced during the process and instructional strategies that they used to address the needs. It is worth noting that at a number of universities, a MOOC instructor and an instructional designer are the same person. At other universities, the instructional design department is a separate unit where instructional designers work collaboratively with subject matter experts, the MOOC instructors, on designing the MOOCs. From this purpose come the following research questions:

- What were MOOC instructors' and designers' perceptions of multicultural learners' needs when designing MOOCs?
- What instructional strategies were used to address multicultural learners' needs in a MOOC learning environment?
- What were the pedagogical challenges that MOOC instructors and designers faced in determining and addressing multicultural learners' needs in a MOOC?

Context of the Study

MOOCs and types of MOOCs. The term "Massive Open Online Course" (MOOC) was first used to describe a twelve-week online course, Connectivism and Connected Knowledge, designed by George Siemens and Stephen Downes and offered at the University of Manitoba, Canada, in the fall semester of 2008 (Cormier & Siemens, 2010). "Massive" refers to the capacity for courses to enroll large numbers of students, as well as to track vast quantities of participant activity and performance data. "Open" refers to no or low-cost participation. "Open" also refers to produced materials for the course that are accessible to all learners with an adequate Internet connection. As online courses, MOOCs are available via the Internet on a variety of devices and thus expand access beyond the traditional campus. Labeled as a "course," a MOOC is framed in a time period with a beginning and an ending point, provides a coherent set of resources, and follows a sequence of activities organized by an instructor in order to address specific learning objectives (Hollands & Tirthali, 2014).

Classifications of MOOCs may vary depending upon the pedagogical interactions, learning outcomes, or learners' experiences (Haavind & Sistek-Chandler, 2015). MOOCs are generally categorized into two types, cMOOCs and xMOOCs, based on the course content structure, expectations of learners' performance, and assessment methods. Connectivist MOOCs, known as cMOOCs, are fluid in structure. They focus more on an overarching instructional goal and are less directive with respect to process. Fostering social interaction through sharing ideas and negotiation of meaning is encouraged in a cMOOC (Bonk, Lee, Reeves, & Reynolds, in press). Learners in a cMOOCs build their knowledge through co-creating assignments with peers. The role of the instructor is to act

as a facilitator by aggregating, reviewing, summarizing and reflecting on participant activity on a daily or weekly basis (Hollands & Tirthali, 2014). The success of a cMOOC is highly dependent on participant interaction via discussion forums (Andersen & Ponti, 2014).

Content-based MOOCs, or xMOOCs, present the course content through different modules of knowledge and methods that assess learners' mastery of the knowledge (Kim, 2015). Course content usually includes short lecture videos each week, often supported by supplementary readings, and assignments. Assessments that count toward the learner's final score are usually multiple-choice or short answer quizzes that are auto-graded.

Beginning in 2013, a pMOOC model emerged in addition to the above two types of MOOCs. A pMOOC is content-based and highly structured in terms of how the course content is organized and presented, but it also blends a project-based model of assessment. Learners in a pMOOC create a collaborative project or problem-solving assignment to earn a grade (Reeves & Hedberg, 2014). In this type of MOOCs, the task for the learner is to design a project that is reviewed by peers using an articulated rubric created by the instructor or teaching staff (Haavind & Sistek-Chandler, 2015). Course completion requirements in a pMOOC typically include submitting projects for peer grades and reviewing a number of mini-projects designed by peers (Haavind & Sistek-Chandler, 2015). The MOOCs examined in this study include all these types of MOOCs: cMOOCs, xMOOCs, and pMOOCs.

A few words about MOOC pedagogy. The technical capacity for massive enrollments, together with open acceptance of all learners who sign up for MOOCs, has raised significant implications for MOOC pedagogy (Klobas, Mackintosh, & Murphy,

2014). For example, according to a white paper by the UK Centre for Educational Technology, Interoperability and Standards (CETIS), openness in MOOCs (i.e. open assessment and open curriculum) allow the learners to choose whether or not to have their work assessed as in pMOOCs or allow learners to create their own curriculum as in cMOOCs (Yuan & Powell, 2013). Openness in MOOCs can also include: 1) the use of open standards and formats for coding, storing, and sharing learning resources and data; 2) open scheduling in which learners can take the course over any period of time of their choice; or 3) "open access" in which learners of diverse backgrounds are admitted with little restriction on their age, prior knowledge, and intellectual capacity (Klobas, Mackintosh, & Murphy, 2014).

The Internet-based environment and the open nature of MOOCs also allow pedagogical changes to occur in MOOCs offered by an institution without affecting their campus-based courses (Marshall, 2013). The mingling of students with teachers and professionals from around the world provides diverse professional development experiences for the learners. The same is true of resources. Resources gathered from around the globe provide a better opportunity for learning than using resources from only one or two sources, particularly if those resources are brought to the class by the learner. Nonetheless, the lack of admissions requirements in MOOCs challenges course instructors and designers to balance learning objectives, to develop appropriate sequence and pace, to use quality learning materials, and to create satisfactory methods of instruction. The large number of participants in a course also presents challenges to interaction and assessment. Klobas, Mackintosh, and Murphy (2014) suggest certain pedagogical considerations be made by MOOC designers and teachers, such as

identifying the course purpose and audience; setting course timing, establishing the pace and effort, defining course structure and content; and designing interaction and assessment. Nevertheless, absent from these pedagogical guidelines is the examination of aspects of MOOC learners' diverse cultural backgrounds and how that cultural diversity is translated into their learning behaviors and needs.

Large class teaching in higher education. MacGregor et al. (2000) challenged the concept of large classes that are historically lecture-based, instructor-centered and require minimal learner engagement. According to these researchers, the large size and the anonymous nature of large traditional classes make it impossible to facilitate learners' involvement and intellectual development, learning and success (MacGregor et al., 2000). Empirical evidence shows the negative effect of large class size on learning outcomes such as difficulties in incorporating interactive, learner-discussions, emphasis on memorization of knowledge, and limited demonstration of critical and abstract thinking (Fischer & Grant, 1983; Penner, 1984; Bligh, 2002). In addition, large class size negatively affects the opportunities for learners to ask questions (Stones, 1970), the ability to receive personal feedback due to the large volume of learners (Tinto, 1993), the ability to pay adequate attention (Wulff et al., 1987), and accuracy of course grading compared to small size classes (Cuseo, 2004).

The challenges are even more overwhelming in a massive course in a virtual learning environment where learners are literally neither known nor seen by the instructor. Planning a course to serve anonymous and diverse groups of learners around the world presents layers of different challenges. The course may be well intended, but good intentions do not necessarily equal success. As David Gelernter, a computer

scientist at Yale said, “If you have three pet dogs, give them names. If you have 10,000 head of cattle, don’t bother” (Gelernter in Long & Siemens, 2011, p. 32). Siemens interpreted the quote as if you have an unprecedentedly large class size, you need to figure out a different technique from the traditional way to handle it (Siemens, 2015).

The massive nature of MOOCs makes it impossible to apply traditional pedagogical methods that are used in small size conventional classes and expect them to work. For example, it is impossible for a teacher to be involved in the discussion and assessment process or to provide personal customized feedback on an assignment to each of thousands of learners in a MOOC. Furthermore, in a conventional course, instructors can rely on the admission criteria to predict learners’ entry level skills, and these criteria generally guide course content design to meet the majority of the learners’ needs. However, in a MOOC learning environment where learners’ levels of competency can spread across a wide spectrum, it can be extremely challenging and arbitrary to determine the entry skill levels of each group of learners, let alone individual learners, and responding to their needs becomes even trickier.

Learners’ cultural backgrounds play a significant role in their learning behaviors and communication styles in an online learning environment and probably more so in MOOCs. Learners from Western societies most likely have different patterns of learning behaviors and ways of acquiring knowledge than those from the Eastern hemisphere due to the social, cultural values that they were brought up with and the way they were trained at school. Asian learners from China, Japan or South East Asia, for example, reflect a predominant method of acquiring new knowledge through memorization and repetition whereas Western learners are more inclined to extensive reading, critical

thinking and analyzing skill development (Yang, Zheng, & Li, 2006). Asian learners are quieter and more introverted while Western learners tend to appreciate active participation and contribution in the class discussion (Maringe & Sing, 2014). In a virtual learning environment that involves learners across the globe, manifestations of their learning behaviors under the umbrella of cultural identity are most likely much more complex and obscure due to the cultural interaction and exchanges among the learners, and assimilation and adaptation happening along the way.

It is important to mention that MOOCs do not just bring challenges to teaching and learning. It is the massive and open nature of MOOCs that offer numerous opportunities for improving course design. For example, the open content of MOOCs has an enormous impact on the learners by offering a participatory, widely connected learning environment that was heretofore impossible (Jacoby, 2014). The connection between the learners, the change of the instructor's role to a facilitator and a fellow contributor, and the recognition and practice of students' expertise and proactivity in an increasingly networked learning environment such as a MOOC (Stewart, 2013) are the predominant values of this type of course.

Definitions of Terms

Culture refers to the learned patterns of human knowledge, values and beliefs and behaviors that are transferred through generations (Hofstede & McCrae, 2004). Simply put, culture includes customary beliefs, arts, etc., of a particular society, group, place, or time. Fully defined, culture refers to the integrated pattern of human knowledge, belief, and behavior that depends upon the capacity for learning and transmitting knowledge to succeeding generations. It includes the customary beliefs, social forms, and material traits

of a racial, religious, or social group; or the characteristic features of everyday existence (as diversions or a way of life) shared by people in a place or time. It composes the set of shared attitudes, values, goals, and practices that characterizes an institution or organization (Merriam Webster Dictionary, 2016).

Learners in the context of this study refer to the population who enroll in a massive open online course (MOOC).

Diversity refers to a reality created by individuals and groups from a broad spectrum of demographic and philosophical differences. Diversity includes knowing and tolerating differences, relating and practicing mutual respect for qualities and conditions that are different from one's own (i.e. age, ethnicity, class, gender, race, gender expression, educational background, work experiences, etc.), recognizing both the privileges and disadvantages of the discrimination, respecting individual rights to self-identification, and recognizing no single culture being superior to the other (Queensborough Community College, n.d.)

Multicultural learners in this study refer to the inclusion of different types of people of different races, cultures, ages, genders, employment statuses and educational backgrounds who enroll in a MOOC.

Throughout the study, a number of synonymous terms will be repeatedly used to indicate the same groups being involved in the study.

The term *students* was used to refer to the individuals who attend a school, college or university, either face-to-face or online.

The term *learners* and *audience* were used interchangeably to refer to individuals who sign up for the Coursera MOOCs.

The term *participants* and participants were used interchangeably to refer to the MOOC instructors or instructional designers who were participating in the interviewing process of this research study.

The term *candidates* referred to the MOOC instructors or instructional designers who were invited to participate in the interviewing process but not necessarily accepted the invitation.

The terms *instructional designers, course designers,* or *designers* were used interchangeably to refer to individuals who were involved in the design and development of the MOOCs and who participated in this study.

Importance of the Study

Since 2012, higher education institutions have experimented with applying innovative learning technologies to produce and present free content online, and deliver the content to learners across the globe. The result is that many institutions around the world now offer MOOCs. Within three years of their introduction to mainstream audiences, millions of dollars were spent on developing MOOC platforms and courses (Siemens, 2012), and millions of people had registered for MOOCs (more than 900,000 people signed up for MOOCs on Coursera alone) (Young, 2012). Yet, there is little research on MOOCs and how MOOC learners' needs, derived from their diverse cultural identities, are identified and addressed. If universities intend to continue funding these free courses that target global learners, it is important to investigate these learners' various learning needs and design instructional strategies that respond to them.

This study is a small step toward learning more about how MOOC instructors and instructional designers perceive the needs of learners from a variety of cultures, and how

this perception influences course design and delivery. Collected data may help inform course developers of the diverse learning needs of the learners, thereby enhancing pedagogical supports. Appropriate course design features can be determined for use in designing MOOCs that respond to learners' needs. It is hoped that findings from this study will be implemented in future MOOC designs and improve MOOC learners' outcomes and satisfaction.

Limitations of the Study

There are several known limitations for this study. MOOCs are a relatively new phenomenon, and few empirical studies on MOOCs exist at this time. Because participants in this study teach at institutions across the United States, and given the time and financial constraints that prevented the researcher from traveling, only online modes of communication were chosen to carry out the data collection process.

Chapter Summary

Chapter 1 provided details of this study and an overview of why this research study was needed. With all the rapid changes in higher education, MOOCs are a relatively new educational solution that may or may not meet the learning requirements of the global learners that they target. However, the merit of bringing quality education from prestigious universities to a global audience and providing opportunities for lifelong learning is laudable and therefore, worthy of further research. However, as indicated earlier, because of the scarcity of research on MOOCs in the literature, more thorough investigations on MOOCs are needed to determine if this is an effective learning model to realize the goals of increasing access and achieving effective learning.

Knowing more about learners' needs and incorporating responses to those needs in the course content design and management is powerful and helps to make achievement more feasible for different groups of learners. By conducting this study, the researcher hopes to add to the rapidly developing body of knowledge in the design and teaching of MOOCs in order to help course instructors and designers meet the challenges of teaching to a global audience, as well as other widely divergent groups within the United States.

Chapter II

Literature Review

Introduction

The purpose of this study was to describe the perceptions of MOOC instructors and designers regarding multicultural learners' needs in their courses and how those perceptions are manifested in the design phase of the MOOC. The study also examined the perceptions of these instructors and designers about the pedagogical challenges they faced when designing the MOOCs for learners across the globe. In addition, the study explored different instructional strategies that MOOC instructors and designers used to respond to the learners' needs in the MOOC learning environment. This study focused on answering the following questions:

- What were MOOC instructors' and designers' perceptions of multicultural learners' needs when designing MOOCs?
- What instructional strategies were used to address multicultural learners' needs in a MOOC learning environment?
- What were the pedagogical challenges that MOOC instructors and designers faced in determining and addressing multicultural learners' needs in a MOOC?

Chapter 2 presents a comprehensive review of literature that serves to set the prerequisite understanding to approach the research questions. The topics covered in this chapter include: 1) culture and age-related diversity in online learning; 2) the anatomy of MOOCs; 3) the roles of an instructor in a MOOC; 4) MOOC learners; 5) designing courses for culturally diverse online learning; and 6) MOOC pedagogy.

Culture and Age-Related Diversity in Online Education

A review of cultural issues in web-based education reveals limited research findings on the impact of different teaching techniques on diverse cultural groups in the online learning environment, or any relationship between cultural dimensions and the design of effective online learning (Wang & Reeves, 2007). Goodfellow and Hewling (2005) categorized cultural issues in the online learning environment into three themes: the existence of dominant cultural values embedded in teaching materials and methods (Gunawardena et al., 2003), potential miscommunication among learners from different cultures in online discussion activities (Wong & Trinidad, 2004), and the emergence of an academic culture within an online program (Hakkarainen, 2003). This paper adopts the definition of culture presented by Ke, Chavez and Herrera (2013) that involves 1) learning and communication styles brought by individual learners and influenced by their preexisting cultural identity, and 2) patterns of engagement in online learning environment by these learners. A number of major cultural issues in online learning environment can be traced back to language differences in content and communication (Joo, 1999). Examples are the clash between the low-context norm of online pedagogies and high-context norm of learner's cultural values (Adeoye & Wentling, 2007; Anakwe et al. 1999; Wang, 2007), and their different beliefs in the value of knowledge and how to acquire it (Chen, Bennett, & Maton, 2008; Makoe, 2006).

Despite the high need to accommodate cultural differences in online instruction, it is very challenging for the instructor to accommodate the culture of every learner, especially in a large class. This becomes a problem when the values from one culture are not seen as appropriate in another (Reeves & Reeves, 1997). Principles proposed to

construct culturally accommodating pedagogy in an online learning environment include creating constructivist and equitable online environment and allowing different configurations of pedagogical operations (Collis, 1999; McLoughlin & Oliver, 2000; Wang & Reeves, 2007).

A review of literature on online education across cultures reveals 44 articles on the subject. Almost half of them provides insights into online learning experiences and perceptions of students of different cultures. The remainder explores the development of cross-cultural online instruction from the institutional point of view (Ke & Chavez, 2013). Findings on the online learning experience reveal that learners' thoughts and actions in a regular online class conflicted with those of the minority groups of languages and cultures, and the reasons could be their different cultural values (Adeoye & Wentling, 2007; Anakwe, Kessler, & Christensen, 1999), or their different beliefs about the nature of knowledge (Chen, Bennett, & Maton, 2008; Makoe, 2006). Suggestions for the importance of online pedagogy has been focused on the micro level by dealing with learner language and learning styles, but Van de Branden and Lambert (1999) challenged that idea with the argument that online learning environment also creates its own learning environment. They closely associated the concept of online and distant learning with the principle of cultural mobility, lifelong learning, and accept cultural difference at a starting point of learning and treat it as a fact.

Important issues in online instruction across cultures are: 1) impact of learners' culture and language on their learning behaviors (Anderson & Simpson, 2007), and 2) the design and implementation of specific models of instruction to address student ways of learning and interaction online (Llambi et. al., 2008; Smith & Ayers, 2006). For example,

Johari (2005) suggested responding to learner needs of language, learning styles and preferences by integrating eight different methods in preparing instructional materials and strategies to match learners to different courses (i.e. language, educational culture, technical infrastructure, primary audience, learning styles, reasoning patterns, cultural context, and social context). Henderson (1996, 2007) built her Multiple Cultural Pedagogic Model of interactive multimedia instructional design that adds on Reeves' 14 dimensions (i.e. pedagogical philosophy, goal orientation, role of instructor, value of errors, motivation, etc.) to incorporate multicultural perspectives and allow learners to maintain their various cultural identities.

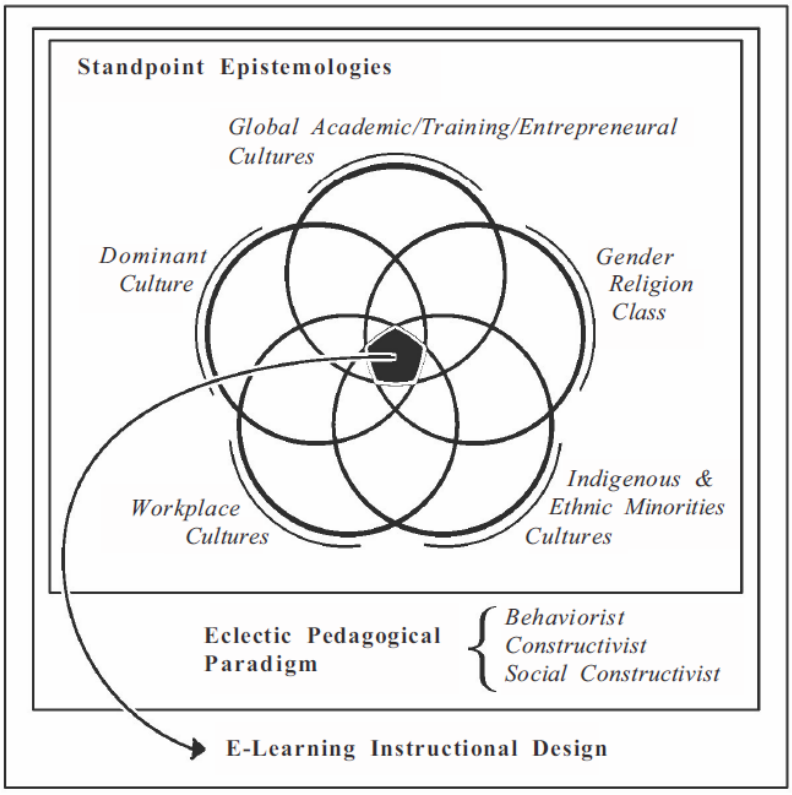

Figure 1. Henderson's Multiple Cultural Pedagogic Model.

Critical findings on online instruction across cultures indicate that the practices and approaches usually applied in online learning are often at odds with the different

ways of thinking and acting by learners of diverse cultures and languages (Ke & Chavez, 2013). These cultural and language differences cause major barriers for the design and implementation of online communication (Dillon et al., 2007). For example, it occurs to both native speakers and non-native speakers that language differences such as different usages of words and writing styles can be a major factor that contributes to their feeling of culturally disconnected. Different learning styles, different forms of communication and different personal expectations among different cultural groups of learners also impact their learning and communication effectiveness (Dillon et al., 2007).

Research on age-related diversity in higher education online learning environments identify older online learners as non-traditional students over 24 years of age (Ke & Chavez, 2013) who return to postsecondary education part time (Davis, 2006; McGivney, 2004) and demonstrate significant academic and lifestyle difference compared to the traditional students (Guido-Dibrito & Chavez, 2003; Richardson & King, 1998). On the other hand, flexible time and space of online learning allows them to do school work around their job and family responsibilities (Cercone, 2008). Thus, patterns of engagement in online discussions and online learning processes might differ by age. For example, Chyung (2007) and Hoskins and van Hooff (2005) reported that older adult learners (i.e. 40 to 57 years of age) posted more online messages. The hypothesis for this is as adult learners get older and have more work experience, they may be able or willing to provide more comments based on their experiences (Chyung, 2007). Older learners learn best through active experimentation and converging observations and reflections to form theories or conclusions (Buerck, Malmstrom, &

Peppers, 2003) besides demonstrating higher self-regulated learning ability and IT skills (Shinkareva & Benson, 2007).

Overall, current literature on culture and age-related diversity contribute valuable suggestions to respond to learners' cultural needs in an online class and recognize endeavors made by the instructor to respond to such needs. However, the challenges of accommodating the cultural needs of each learner, especially in a large online class, is very difficult to overcome. The literature also shows the lack of comprehensive empirical studies that examine the relationship between these aspects of learner diversity across disciplines and with a broader age and culture range from the population.

The Anatomy of MOOCs

A MOOC is more than its parts of massive, open, online course. MOOCs are associated with the capacity of the current technology platforms that allow massive number of learners to enroll, the values of the platforms (Coursera, edX, and others) and course instructors (university professors), and the very philanthropic idea that courses can be offered for free to low cost by the best teachers from the best universities for anyone who wishes to enroll (Klobas, Mackintosh, & Murphy, 2014). This section of the chapter deals with the anatomy of MOOC courses, current practices in relation to educational and psychological theories, and pedagogical issues associated with MOOC components and users.

What is a MOOC? The term "MOOC" (Massive Open Online Course) was coined by David Cormier (Cormier & Siemens, 2010) to describe a twelve-week online course, *Connectivism and Connected Knowledge*, designed by George Siemens and Stephen Downes and offered at the University of Manitoba, Canada, in the fall semester

2008. The term “Massive” refers to the actual numbers of course participants, the capacity for courses to enroll large numbers, the capability to allow very high levels of participant activity and generate large amounts of performance data. “Open” refers to the possibility for anyone with an adequate Internet connection to participate in the course. Openness in MOOCs requires an open delivery platform that gives learners free access when they sign up for the course. As online courses, MOOCs are available via the Internet on a variety of devices to facilitate scale and to expand access beyond the traditional campus. To be labeled as a “course,” a MOOC should be bounded by time: it has a beginning and end point. However a new flexible option was recently made available for on-demand courses in the Coursera platform. A MOOC provides a coherent set of resources and follows a sequence of activities organized by an instructor in order to address specific learning objectives (Hollands & Tirthali, 2014).

Types of MOOCs. Ebben and Murphy (2014) did a comprehensive search of nine academic databases on MOOC scholarship from 2009-2013 and conceptualized two phases of MOOCs: Connectivist MOOCs (cMOOCs) and content-based MOOCs (xMOOCs).

Connectivist cMOOCs, engagement and creativity 2009-2011/2012. The two central themes of this phase are: 1) the development of Connectivism as a learning theory, and 2) technological experimentation and innovation with Connectivism in early cMOOCs. A common research question in this early phase was aimed at understanding the under-performing learners in a massive course (Ebben & Murphy, 2014). The attributes of Connectivism by early cMOOCs investigators include autonomous/independent learning style; engaged learning in an open environment; and

participatory interactivity emphasis. Key questions raised in this MOOC phase evolve around autonomous learning such as: 1) What is the best way to create a high-quality learning environment for self-directed learners? 2) Are the principles of Connectivism getting realized properly and fully in MOOCs? 3) What is the best way to support autonomous learners in MOOCs?, and 4) What are the most effective tools and applications for learners? (Ebben & Murphy, 2014).

In terms of course structure, cMOOCs are described as more fluid in structure that addresses an overarching instructional goal or question. The success of the cMOOCs is determined by learner interaction on the discussion forums. Course assignments are usually customized products, such as blog posts, images, diagrams, or videos generated by learners using a variety of social media. The instructor in a cMOOC plays the role of a facilitator by aggregating, reviewing, summarizing and reflecting on the learner's activity in a daily or weekly basis (Hollands & Tirthali, 2014).

Content-based or modern xMOOCs, learning analytics and assessment 2012-2013. An xMOOC is an existing conventional course made available online, and thus employs the pedagogical practice and format of the traditional face-to-face classroom (Pomerol, Epelboin, & Thoury, 2015). These are the knowledge transmission courses that are structured as weekly sequences of activities and require individual learners to participate in activities that approximate a conventional classroom course. Instruction includes several short lecture videos per week, often supported by supplementary readings, and problem sets. Assessments that count towards the participant's final score are provided, usually weekly, in the form of auto-graded multiple choices or short answer quizzes or peer-graded assignments. Online discussion forums allow learners to engage

with each other and request technical and instructional support or are used to create a sense of community (Hollands & Tirthali, 2014). Platforms such as Coursera or edX are currently the principal providers of the content-based xMOOCs.

Modern xMOOCs and learning analytics. A large part of statistical data collection for the xMOOCs is called "learning analytics." The data are used to identify patterns to understand learning behaviors and outcomes based on demographical data and correlate learner characteristics (i.e. age, gender, nationality, etc.) with achievement in MOOCs. In this regard, Breslow et al. (2013) found that achievement is more correlated with individual knowledge and competencies than with the learner's demographic data. Analytics also helps to identify ways learners use course materials available in MOOCs, to recognize high-performing individuals and draw their activities and behaviors in the MOOCs, and to determine the best way to present the course materials. According to Breslow et al. (2013), learning analytics research offers a deeper understanding about the ways in which backgrounds and learners' engagement with course content either support or hinder their ability to pursue and complete the course. Clow (2013), on the other hand, provided speculations about MOOC low completion rate. MOOC learners come and go, and use MOOCs resources by taking the specific bits and pieces they seek. There is less initial commitment to consistent progress throughout the course, and a tendency for strongly non-homogeneous patterns of engagement in the MOOCs by the learners.

The boundaries between the types of MOOCs are not always clear. There are MOOCs that share both characteristics of an xMOOC and a cMOOC. For instance, there are content-based, highly structured MOOCs that also employ a use of blend project-based model of assessment that requires learners to design a project and uses peer review

with a detailed rubric provided by the instructor. This type of MOOC is called pMOOC (or project-based MOOC). Course completion requirements in a pMOOC typically include submitting projects for peer feedback and reviewing a number of mini projects designed by peers (Haavind & Sistek-Chandler, 2015).

Reeves and Hedberg (2014) described the differences among the three types of MOOCs as shown in Table 1.

Table 1

Differences among Three Types of MOOCs

Type of MOOC	cMOOC	xMOOC	pMOOC
Learner Role	Active	Passive	Active
Instructor Role	Co-learner	Sage on video stage	Guide on the side
Learning Theory	Connectivism	Behaviorism	Constructivism
Primary Pedagogy	Knowledge integration	Knowledge duplication	Knowledge production
Metaphor	“We link movies”	“We watch movies”	“We make movies”
Development approach	Learning design	Instructional design	Educational design research
Primary type of assessment	Self-Assessment	External and/or peer assessment	Self and/or Client assessment
Funding Source	Seat of the pants funding	Large external funding	Moderate client provided funding

MOOC technology. MOOCs merge the strengths of online learning with pedagogy and instructional technology such as Web-enhanced learning, Connectivism theory, learning management systems, e-learning, computer-based education and training (Klobas, Mackintosh, & Murphy, 2014). Owing to the technical capacity for massive enrollments as well as the open acceptance of all learners who sign up for a MOOC, there are significant implications for MOOC pedagogy. For example, according to a white paper by the UK Centre for Educational Technology, Interoperability and Standards, two definitions of openness are emerging among MOOCs: open assessment and open curriculum. Open assessment means learners choose whether or not to have their work assessed, while open curriculum means learners create their own curriculum (Yuan & Powell, 2013). However, interpretations of the word "open" in MOOCs are more than just about assessment and curriculum. Open can also describe the use of open standards and formats for coding, storing, and sharing learning resources and data, or open scheduling in which learners can take the course over any period of time of their choice. Importantly, "open" can also be “open access,” which means the MOOC welcomes learners’ diverse backgrounds with few restrictions on their age, prior knowledge, and intellectual capacity. This, as mentioned above, is one of the merits of MOOCs, but open access also causes critical pedagogical issues and challenges for MOOC designers as they design a MOOC for learners of diverse backgrounds, needs, skills, and expectations.

MOOC learners. MOOC learners are the ones who voluntarily sign up for a MOOC. Unlike a conventional online course, not all MOOC learners intend to complete the course. The diversity of learner intentions and backgrounds, as well as the various offline learning activities they pursue, distinguish the MOOC context from traditional

classrooms (Breslow, Pritchard, DeBoer, Stump, Ho, & Seaton, 2013). In other words, the massive participation, the open content, and the free-of-charge nature of MOOCs allow different levels of participation among the learners. Klobas et al. (2014) rigorously categorized MOOC learners based on their participation in the course and their interaction with the materials into six groups: 1) "Registrants," who register for a MOOC but do no more; 2) "Scanners," who scan some materials without downloading or participating; "Downloaders," who download materials but do not participate; "Passive Participants," who follow at least part of the first section, but do not complete the first quiz or any other learning activity; "Active Participants" who complete only the first activity or who participate for a longer period without completing the course; "Finishers" who complete the course and may or may not require a certificate of completion (Klobas et al., 2014). The free come-and-go and/or switching from one type of learner to another affects the quality of the online discussion in the discussion forum, the main place for interaction and the source for the instructor to gather learner feedback. The dynamic behaviors of the learners can create a chaotic learning environment and may present challenges to MOOC pedagogy on the part of the instructor.

The MOOC as a course. MOOCs are online distributed courses on a hosting platform. The types of learning materials and activities are constrained by the available technological capacities which are constantly evolving. Furthermore, openness to any learners anywhere anytime challenges course designers to balance out learning objectives, appropriate sequence and pace, the quality of the learning materials, and satisfactory methods of assessment, among others. Also, the large number of learners in the course may present difficulties on interaction and assessment (Klobas, Mackintosh, &

Murphy, 2014). Regarding these, Klobas, Mackintosh, and Murphy (2014) suggested that a MOOC designer and teacher must make pedagogical decisions in the following categories:

Purpose and audience: These decisions include the goal of the course and the learning objectives, given that there may be a massive enrollment.

Course length, pace and effort: Current MOOCs range from 2-3 weeks to 15-16 weeks long. Training and personal development courses are usually shorter. University MOOCs are usually five weeks or longer. Options for pace include entirely self-paced, weekly activities set with or without deadlines, or a combination of these. Effort refers to estimated number of hours the learners are expected to spend in each period or for each activity. This is both important for the planning and self-regulating of their study, and for accreditation (i.e. granting credit to a course by an educational institution) of MOOCs, if applicable.

Course structure: A course is usually segmented into different modules in which each section is defined by objectives, what the learners are expected to learn. Content and learning activities, including quizzes and assignments are designed toward these specific objectives for each section.

Course content: xMOOC content typically includes short videos of 5-10 minutes. Types of videos also play a role in learner engagement. Video subscribing, or videos that include a combination of slides and the lecturer's "talking head" are engaging (Guo, Kim, & Rubin, 2014). Other content consists of exercises, quizzes, homework assignments and other learning activities such as reflections on presented content, or independent research activities.

Design interaction: In order for forum interactions and discussions to be effective, discussion questions needs to be designed and structured and in line with the learning objectives.

Assessment: Different types of assessment (peer, self-assessment or computer-based assessment) are used with monitoring methods of assessment (i.e. anonymous or with learners' identification).

Using these pedagogical guidelines will most likely increase the quality of the MOOC. However, these guidelines do not include any considerations of the expected wide range of learners' diversity. In other words, instructional strategies for learners with different backgrounds (i.e. age, gender, employment status, educational status, language, and ethnicity), different skills (subject skills, educational level, language skills), and different needs may not be given the attention they deserve in the pedagogical decision process. As indicated earlier, a review of cultural and age-related diversity in online learning presents valuable suggestions for acknowledging learner's cultural needs in an online class and appropriately responding to those needs. However, to accommodate the cultural needs of each individual learner in a massive online class is an impossible task.

Planning a MOOC that serves unknown diverse learners presents layers of difficulties, and a designer's good intentions may not necessarily result in success. For example, in terms of student interaction and familiarity with the content materials, an in-depth series of content video presentations for a tool-based MOOC such as *Powerful to Teaching and Learning: Digital Storytelling* might be much more beneficial and intriguing to a group of learners with adequate skills in educational storytelling and who have used these technologies before. Meanwhile, the same series of videos might be

overwhelming to those with English language barriers and limited technological exposure. These learners' lack of exposure or unfamiliarity with the content materials may be the result of their limited access to technology where they live. They may never have heard a story in English or may not have any exposure to technology tools. There is a need to therefore train this group of learners starting from the very basic skills in order for them to effectively learn the content of the videos and complete the course assignments. The question is, "How does an instructor or instructional designer know which groups of learners need what interventions in order to succeed?" With a conventional course, admission criteria may somewhat indicate the entry level skills of the learners and aids in course content design in order to meet the needs of the majority of the learners. In a MOOC learning environment, however, learners' entry skills are not screened beforehand and their levels of competency can range across the entire spectrum from beginner to expert. This can make the task of responding to their needs increasingly challenging and may involve a lot of conjecture, resulting in arbitrary design decisions. Thus, this study aimed to explore: how did the instructors and/or designers identify the learner's needs? And, if those needs were identified, what instructional strategies were used to address these needs during the design and delivery phase of the MOOC?

The Roles of an Instructor in a MOOC

In an online course such as a MOOC with tens of thousands of learners from across the globe, the role of the instructor goes beyond simply presenting the course materials and assessing the learners. A MOOC instructor might be compared to a "rock star" whose "teaching performance" is viewed by thousands of audience members around the world. A rock star does not have to know their audience in person, just as the MOOC

instructor does not have to know their learners by name, but they both are performing in order to keep their audience in the course or at the concert. Even while the MOOC is a "free show," the course is expected to be designed and delivered in a way that can actually benefit the audience. Thus, to bring quality content knowledge from prestigious universities to learners all over the world for free has been the goal of MOOCs. The problem is that not all MOOC learners are on the same track to benefit from this worthy goal due to their various backgrounds, capacities and expectations. The unknown nature of the learner who enrolls in the course and their needs, backgrounds, capacities and expectations makes it more complex to realize these goals.

Haavind and Sistek-Chandler (2015) conducted an interview research study with eight MOOC instructors from different countries who teach a variety of subject areas in order to understand their perceptions of the role of instructors in a MOOC compared to that in a traditional classroom. Their first finding regarding giving instructor feedback to the learners is that the instructor is not able to grade and give feedback that is meaningful and personal to each individual due to the numbers of learners in a MOOC. Instead, feedback is done automatically by peers or by the course Teaching Assistants (TAs) (Haavind & Sistek-Chandler, 2015). Furthermore, the instructors reported a lack of control due to the overwhelming amount of input from the learners and, consequently, they were mildly disappointed that they were not able to assess all the submitted work.

Due to the high volume of learners in a MOOC, auto-graded methods are usually applied for quizzes and assignments in the xMOOC, and peer assessment is usually employed for pMOOC where learners need feedback to revise their work for the final submission. The instructor's role in this case is to provide answer keys for the auto-

graded quizzes and assignments for an xMOOC and articulated rubrics with examples of sample grading to guide peer assessment in a pMOOC. The high enrollment in a MOOC also makes it impossible for the instructor to communicate with learners individually via email as they do in a traditional course. Instead, discussion forums are provided where the learners post questions and receive responses from peers or course teaching staff who monitor the discussion board. The instructor is involved in the discussion when needed.

The quality of the instruction is critical in the discussion of the MOOC instructor's role. Despite the "effective learning methods" designed into Coursera as "seeking out sound pedagogy on effective learning methods and then translate the concepts into processes that could be built into the design of the platform itself" (Audsley et al., 2013, p. 134) and despite the use of interactive exercises (Coursera, n.d.-a) which is a key factor in the design of the Coursera system, the instructor must first know how to teach (Feldstein, 2012). Thus, the roles and responsibility of the instructor in engaging learning in a MOOC continues to be challenging (Haavind & Sistek-Chandler, 2015). According to Holland and Tirthali (2014), the question of whether learners gain skills and knowledge in a MOOC has not been straightforwardly addressed because institutions might pursue MOOCs for different reasons other than improving teaching and learning (i.e. expanding reach, increasing the reputation of the school or organization, and maintaining the brand identity, etc.). Thus, research findings on effective online teaching practices should not be ignored once the institutions and instructors are committed to pursuing MOOCs. Such practices include individualizing and personalizing interaction with learners. Research shows learner-instructor and instructor-learner interaction is a critical factor in increasing the persistence of online learners (Croxton, 2014). At present,

learner-instructor interaction in the MOOC learning environment is still at minimum due to the massive numbers of learners.

The good news is, due to some pedagogical similarities between the xMOOCs and conventional courses, best practices in MOOCs are also the same ones in a non-massive scale learning environment. Multiple research studies (Bali, 2014; Tomkin & Charlevoix, 2014; Zhang, 2013) suggest potential best teaching practices in a MOOC environment are within the reach of any instructor. These practices along with brief descriptions are:

Presentation skills: Video presentations of high quality must have good articulation and must convey a personable message to the learners by means of, but not limited to a warm, friendly tone, humor and personality, and appropriate body gestures.

Strong content: Quality, relevant content, timely topic with accessible resources help to retain the massive audience.

Managerial skills: These include the management of TAs, course content, and flow. For instance, assigning TAs online hours to maintain 24/7 global presence.

Personalization: A common strategy is to encourage small group gatherings (by language background, by geographic region, or common interests, etc.), to offer different opportunities for peer discussions and feedback. Another strategy is to employ different communication channels, synchronous section, or point out trending conversations or make regular personalized email notifications that address learners by names.

Feedback: This includes the use of additional instant feedback such as notifications of responses to threads in which a learner posts.

Fostering learner-centered interaction: Multiple perspectives on interacting with the learners are presented by the participants in Haavind's (2015) study. For example, one instructor felt rewarded to find conversations that were interesting to him when he surfed the discussion boards. Another instructor felt that building a professional community was the main goal when teaching a MOOC, and yet another enjoyed investing her curiosity in her own subject matter through browsing a large pool of learner discussion (Haavind, 2015).

Applying best practices in MOOCs varies greatly by the instructors and the subjects that they teach. For example, instructors' presentation skills, including their sense of humor, their tone and appropriate body language when presenting the content might be more appreciated in a social science MOOC such as psychology rather than in a computer science MOOC. The extent to which the instructor can apply these practices effectively in turn is determined by their own instructional competencies, their level of subject expertise, the level of comfort in using technology in instruction and the group of learners they are interacting with. Matching the instructor's teaching skills and the learners' diverse needs is a two-way negotiation. The next section will examine global learners' characteristics in an online learning environment.

MOOC Learners

The impact of cultural identity on learning and communication style. Teaching a demographically diverse class is challenging. Teaching it online without really knowing the learners' characteristics and status presents extra challenges. According to Maringe and Sing (2014), "demographic diversity" is a broad term that includes variables falling under these categories: 1) race category, including variables

such as country of origin, ethnic background, and language; 2) physical category such as age, race, and gender; and 3) socio-economic variables such as family education, family occupations, family wealth and social class. Family socioeconomic status is one of the direct contributors to student's educational performance. Students from poor socioeconomic backgrounds consistently under-perform compared to their counterparts from higher socio-economic groups (Maringe & Sing, 2014).

Even though there is no evidence that race has any influence on learners' ability to learn, variables in this category reveal valuable insights on how cultural and racial identity shapes one's learning styles, their participation in group learning, their response to teachers and to cultural nuances (Ke & Chavez, 2013). For example, in regards to how one learns a new concept, depth of understanding in learning is achieved through repetition and memorization in Eastern culture whereas it is achieved through wide reading and application in Western culture (Dahlin & Watkins, 2000; Jennings, 2012; Vandermensbrugghe, 2004). Asian learners from China, Japan or other countries of this cultural group, for example, may find it difficult to adjust to the extensive reading requirements in a Western university (Maringe & Jennings, 2013). In terms of collaborative and individual learning, Western learners tend to be more individualistic and value individual achievements while Eastern learners tend to value group performances over individual ones (Kobayashi, Kerbo, & Sharp, 2010). These factors may have an effect on learners' preferred learning styles. For example, Asian learners might encounter a great obstacle and be confused in a Western learning environment where independent and learning autonomy is valued since they are accustomed to taking directions from the instructors.

Cultural norms associated with participating in group activities vary by the society and may affect learner communication styles in learning. Reflective participation is more valued than impulsive responses in Eastern cultures while the opposite is valued in the Mid-Eastern communities. Asian students are trained at an early age to be considerate and reflective when speaking, while in the Middle-Eastern culture, providing answers even before the question is completed indicates full engagement in conversation (Maringe & Sing, 2014). In many Western cultures, fluency and quick responses are regarded as intelligence and quick-mindedness while in other societies it might be seen as a sign of being less thoughtful or considerate.

In hierarchical Eastern societies, children are taught not to speak in the presence of adults, not to express opinions to an older person, and not to look straight into the eyes of elders during conversation (Maringe & Sing, 2014). This may affect the development of self-expression and critical thinking skills for learners of these cultural groups. When attempting to cultivate and nurture critical thinking skills and the Western style of communication in a culturally diverse classroom, the instructor needs to be fully aware of the background of these learners compared to those learners who are accustomed to expressing themselves openly and freely.

The English language and cultural nuances add challenges to international learners who are struggling to adapt to the global classroom culture. Word use in some cultural contexts can carry very different meanings and nuances and interpreted very differently in others (Walqui & Heritage, 2012). For example, when an American professor says a student's work is interesting, "interesting" can mean anything. Usually it indicates the work has some good parts, but revision needs to be made. To some Asian

groups, however, “interesting” is much more powerful. It can be understood as “awesome” or “unique.” It takes time and social exposure for these groups to be able to read between the lines, to pick up the tone and cultural clues of the nuanced comments and feedback in these learning environments.

MOOCs represent a true demographically diverse learning environment because of the learners and their diverse characteristics (i.e. their language, culture and educational background, their learning styles, etc.). What are the challenges for teaching such an intense demographically diverse massive class? What are the ways to invite students’ contributions regardless of their differences in language and culture and upbringing? How to identify the students’ learning needs and what are the responses to their needs? These are the questions that this research study explores.

Diversity in MOOC learners’ background and behaviors in relationship to performance. Deboer, Stump, Seaton and Breslow (2013) studied aspects of learners’ diverse background and behaviors in relation to performance in an edX course at Massachusetts Institute of Technology that involved learners from nearly every country in the world. They gathered detailed individual background data from learners who completed a post-course survey. Their research showed that learner performance varies significantly according to the learner’s background characteristics. For example, learners’ prior educational experience was an important factor in predicting their success. Learners with lower level of prior knowledge may need more exposure to the course to increase their understandings of course concepts even though their performance in the course may be more of a reflection of time and effort spent on assignments than the increase of knowledge and skills. This is further supported by Phan, McNeil and Robin’s (2016)

findings from a study involving the *Digital Storytelling* MOOC that learners who are "equipped with moderate subject knowledge seem to be at a more advantageous position and thus more likely to benefit from the course than the novice group" (p. 43).

Moreover, active engagement is a strong indicator of MOOC quality and learner satisfaction (Ho et al., 2014; Jordan, 2014). Learners who demonstrate active engagement during a MOOC tend to outperform those who do not prioritize a similar trait (Phan et al., 2016). However, there is also a significant correlation between learners' levels of education with their course performance. Learners with a Ph.D. in a science or engineering field tend to outperform those with lower degrees, and there are no significant differences among learners with a Bachelor's degree and lower (Deboer et al, 2013). Deboer et al. (2013) also suggested that learners who collaborate with others offline may do better in class. This suggests MOOC instructors and designers can facilitate further learning in their MOOC by creating different communication venues that encourage collaboration and interaction among groups of MOOC learners.

Learners' communication patterns in MOOCs. Research findings on learners' communication patterns in MOOCs are important as they not only depict a multicultural classroom but also provide MOOC instructors with insights on how to monitor and facilitate forum discussions in the MOOC. Gillani and Eynon (2014) conducted a case study that explored which types of learners tend to interact with one another in a *Business Strategy* MOOC. Learners' analytic data show that most forum participants (25% of total 4,337 active forum participants who had created at least one post or comment in the online discussion forums) were well-educated and included learners from Europe or North America who took the course to gain professional skills. Some learners engaged in

rich discussions around topics of high significance, however, the participation was not always consistent and tended to decline as the course progressed to the end. A sizeable proportion of forum participants were high-performing learners, though larger numbers of participants received failing grades (over 73% of forum participants who accounted for nearly 60% of all forum comments and posts received a grade below 50%). Interestingly, the research showed that individuals who performed well and had high skill levels didn't necessarily communicate with one another. This is contradictory to the prior findings that indicated high-performing learners tend to interact with other high-performing learners early in online courses (Vaquero & Cebrian, 2013). These contradictory findings may indicate an argument that MOOCs have the potential to enable communication among learners of different language and cultural background, but also learners across different skill levels and motivation.

Pedagogical Considerations for Instructional Design in MOOCs

Instructional design for MOOCs follows most of the instructional design guidelines for online learning but is affected by additional factors due to the massive open nature of MOOCs. For example, factors specific to MOOCs such as the large number of MOOC learners present additional challenges and require MOOC design to include more than Siemen's principles of connectivism associated with online learning (i.e. learning may reside in non-human appliances, learning is a process of connecting related information sources, etc.) (Bremer, 2012). On the other hand, learner analysis in MOOCs provides insights on MOOC learner characteristics that are different from those in a conventional online or face-to-face course and requires reconceptualization of variables in course design (Deboer, Ho, Stump, & Breslow, 2014). For example,

enrollment in a MOOC is not restricted to a single registration deadline as it is in a traditional course. Instead, most MOOCs do not restrict when learners can enroll in the course MOOC and for what purposes (Deboer, et al., 2014). MOOC learners are unique in that a high percentage of the learner population is more interested in acquiring the content knowledge rather than completing the course to the end, especially if they register for the course because their own educational institutions do not offer the course in that specific content (Flynn, 2013). MOOCs also increase the amount of interaction among the learners and decrease the amount of interaction between learners and instructors and shifting the learner role towards self-directedness and proactivity. Designers of MOOCs must consider these changing roles of the instructors and the learners in their course design.

On the other hand, MOOC pedagogy is a socio-material and disciplinary issue and influenced by the instructor's preferences and beliefs, MOOC enrollment and patterns of learners expectation and engagement (Bayne & Ross, 2014). This section reviews the instructional quality of MOOCs as well as factors that encompass pedagogical considerations for instructional design in MOOCs such as assessment, psychological factors of the learners, and advantages and challenges of massive enrollment.

Instructional quality of MOOCs. The massive nature of MOOCs, indicated by the enormous number of MOOC learners and their unknown characteristics, gives the designers of MOOCs extra challenges and therefore raises the question of whether the instructional quality of MOOCs should be evaluated by the same standards used in an online or face-to-face course. An analysis of the instructional design quality of 76

randomly selected MOOCs (50 xMOOCs and 26 cMOOCs taught in English) was performed by Margaryan, Bianco, and Littlejohn (2015) using Merrill's key criteria (Merrill, 2002, 2009, 2013). These criteria include five principles of instruction (i.e. problem-centered, activation, demonstration, application, and integration) and five principles on learning resources and learning supports (i.e. collective knowledge, collaboration, differentiation, authentic resources, and feedback). Their findings reveal low instructional quality of MOOCs because of the low implementation of principles of instruction in the design. Speculations for the low quality are: 1) possible lack of knowledge of the current instructional design principles by the instructors or designers, or they know them in the traditional setting but not in their MOOCs, 2) instructors are not mainly driven by pedagogical concerns when designing a MOOC, or 3) unknown motivations and goals of individuals and/or institutions when designing a MOOC.

The above findings translate as knowledge of course design and pedagogical concerns as the key to success in MOOC design. In order to be successful, MOOC design needs to give sufficient attention to pedagogy. Many learners are attracted to MOOCs by the brand of the universities offering the courses and expect the same high quality associated with these institutions. This dilemma between what MOOC can offer and the learner expectations happen more frequently in MOOCs offered by elite institutions (Margaryan, Bianco, & Littlejohn, 2015). Findings from the analysis suggest that faculty and instructors offering MOOCs should apply the principles of design as an evaluation framework for quality control and improvements of their MOOCs, or implement the principles together with evaluation on learners' experiences in a MOOC (Margaryan, Bianco & Littlejohn, 2015). As it is implied, it is impossible, and may not always be

necessary to include all ten principles (i.e. Problem-centered, Activation, Demonstration, Application, Integration, Collective knowledge, Collaboration, Differentiation, Authentic resources, and Feedback) in the design phase given the different nature of MOOCs from conventional online courses. Selective implementation of design principles based on their importance seems to be a more realistic alternative in this case.

Assessment system design for global online learners. Peer assessment is an approach proposed by Coursera in attempt to personalize and support individual learning needs (Fournier & Kop, 2015). It involves learners evaluating their peers' work (Kulkarni, et al., 2013) and solves the impractical problem of automated grading and the unrealistic reality of teacher-grading by providing context-appropriate responses through human/peer grading (Hearst, 2000). An advantage of peer assessment is that it allows learners to see work from an assessor's perspective (Tinapple et al., 2013) and exposes them to solutions, strategies, and insights when evaluating peers' works. Peer assessment also increases learner involvement and maturity, lowers the grading burden on staff, and enhances discussion (Boud, 1995).

Pitfalls of peer grading according to Kulkarni et al. (2013) are: 1) generally lower level of expertise on the subject and assessment by the learners compared to that of the staff and instructor, 2) possible biases by the learner graders based on their subject level expertise and cultural background; 3) limiting the learner flexibility due to the imposition of a particular assessment schedule and time frame might, which is somewhat against the idea of unconstrained time-and-place of MOOCs, and 4) possibly causing loss of motivation for learners who received an unfair assessment. However, the data about peer assessment in a large scale online class reveals patterns of peer grading that lead to

improvements of campus-based course materials in ways that small classes may not (Kulkarni et al., 2013).

Kulkarni et al. (2013) argue that peer assessment proposes a changing role for instructors and how they spend their time from doing the grading to articulating assessment criteria for others to use. This finding suggests future work might focus on teaching instructors the best practices for creating rubrics and to create effective design principles. Peer assessment also leads to changing roles of learners from assessment receivers to assessment makers. Evaluating others' work is an extremely valuable learning activity for peers as it gives them the opportunity to look at learner's work from different angles, and it endorses active participation and examination of content through the evaluation. A rising pedagogical question is whether assessment is seen as part of learning activity, and if so, what are the strategies of producing effective learning outcomes through peer assessment?

A natural disadvantage of peer grading is that it is a new and emerging assessment technique as opposed to the well-established and highly-credited assessment method found in a traditional classroom. The learners most likely possess a lower level of subject expertise than that of the instructor, and they are new to grading other people's work. Peer assessment could also be a cultural struggle for learners who do not come from an educational background that values or cultivates critical thinking or giving feedback. Thus, even though peer assessment might not carry the same amount of credibility compared to instructor grading due to the differences in expertise and cultural impact, it almost certainly provides a variety of real-world criticism and may bring multiple perspectives to the learner's work.

The idea of a global classroom with its superb diversity is truly intriguing in all aspects, including peer assessment. How should designers support learners who face motivation issues as consequences of peer evaluation? Can well designed content prevent the aforementioned pitfalls of peer assessment? What can be done to make peer assessment a better learning experience for MOOC learners? Perhaps one thing to bear in mind is that along with an attempt to cover all these concerns during the design and delivery phase, it is reasonable to educate the learners to take time to give constructive feedback to their peers' work and at the same time acknowledge the values of diverse comments and feedback they receive.

Psychological factors of learners. Terras and Ramsay (2015) discussed the psychological factors that influence learners in the context of technology-enhanced learning (MOOC-based learning in particular) and thus created another critical pedagogical consideration. One of the challenges for MOOC designers is the striking differences in the cognitive skills and preferences among learners (Terras & Ramsay, 2015). In a distant-managed course such as a MOOC where autonomous learning is required, learners are expected to take charge of their learning process independently by being able to make choices and decisions concerning the resources they select and the pace of their study (Tschofen & Mackness, 2012). Obviously however, not all MOOC learners have quality learning experiences when taking a MOOC (Kop, 2011). Also, while MOOC resources are open in the sense that they are reusable and modifiable, they are "not always open" unless the learners possess the appropriate knowledge and skills to understand and engage with them (Littlejohn, 2014b, p 1). MOOC instructors and

designers should be aware of this double-sided effect of the open sources in MOOCs and how they might be perceived by different types of learners.

Terras and Ramsay (2015) went on to suggest identifying the challenges by raising awareness of the potential difficulties that MOOC learners may encounter and the psychological cause of the challenges, which in turn can help inform the design and delivery of MOOCs. For example, considering the learners' cognitive and psychological profiles (i.e. their prior knowledge, their technical skills and their feeling towards the MOOCs), applying the appropriate digital literacy skills is required to enable learners to access the full potential of MOOC resources (Terras & Ramsay, 2015). In learning about learners' cognitive and psychological profiles, Koedinger, McLaughlin, and Stamper (2014) called for multidisciplinary cooperation to make sure that a black box approach (i.e. applying the approach without examining how it works) to e-learning is avoided. Papadimitriou, Grigoriadou and Gyftodimos (2014) developed a web-based learner-controlled adaptive educational hypermedia system, known as MATHEMA that accounts for differences in learning styles when forming groups of learners and matches potential members by the learning style and goals to form collaborative partnerships among learners. Capuano and Salerno (2014) explained the semantic connections that guide the learners' navigation and allows the dynamic adaptation of the resources according to learners' needs and preferences (individualization). They developed a model of learning called intuitive guided learning that enables learners to select learning resources based on their own preferences that follow their own personalized learning journey (Capuano & Salerno, 2014).

Advantages and challenges of massive enrollment. Online learning on a massive scale provides a wide range of advantages to learners. MOOC participants can interact with learners from all over the world who have a wide range of diverse cultural perspectives as well as access resources provided by those learners in the form of discussion and links. MOOCs learners have the opportunity to exchange perspectives on content posts that are shaped by their cultural background and personal experiences. Thus the interactions and learning can be rich, contextualized and authentic with the contributions of learners from different countries and cultures (Rensing, Freitas, Ley & Muñoz-Merino, 2014). Instructors may receive benefits from teaching MOOCs by enhancing their reputation to a global audience, acquiring a sense of pride in making an impact, and the sharing a personal passion and enthusiasm on the subject with learners worldwide. The increasing access to learners and resources is another big advantage that can motivate instructors to develop their teaching practices, to try new teaching styles and methods, and especially to gain a wealth of input from learners (Ferguson & Sharples, 2014).

Massive pedagogy certainly brings critical pedagogical challenges. The most explicit challenge can be the navigating and filtering of resources on the web since it houses an ocean of resources and input from all the learners. The second challenge is the question of how learners can ensure that they receive good quality support and feedback online if the resources are not being filtered. The third challenge for the learners is navigating the platform on which the course is hosted. Learners might find themselves "lost in hyperspace" if they cannot identify where they are, cannot return to previously visited information or remember what they have covered (Ferguson & Sharples, 2014).

Unlike a conventional online course where it is the learner's responsibility to seek the instructor for help and it is the instructor's job to provide immediate response, MOOC learners have to depend on assistance from the Teaching Staff (TA) or peers who spot and respond to their problem. In a number of MOOCs, TAs are assigned certain hours to provide monitoring and support on the discussion forums, but there is still a question of high volume of issues to manage by a handful of TAs. For the instructor, the biggest challenge may be the pressure and workload to maintain the same positive mentality about the course over time. Developing and maintaining effective teaching practices in a MOOC that serves tens of thousands of learners is challenging and requires significant time and effort while the instructors still usually have to perform various vital roles in their institutions.

Chapter Summary

Chapter 2 provided a review of the literature in four major sections that contribute insights to explore the research problems. The first section explored research findings on culture and age-related diversity in online learning. The purpose of this part was to reveal the achievements and remaining challenges of research and practices of designing web-based learning environment to accommodate the needs of learners of wide culture and age range. Challenges of accommodating learning needs of learners of diverse culture and large age range in MOOC environment are great. The second section of the literature review explored different aspects of MOOCs that provide insights into pedagogical and technological capacities and potentials of MOOC to make a quality learning experience possible for an increasing number of learners. The third section described the roles of the instructor in MOOCs. MOOC instructor's roles change dramatically from a predominant

knowledge provider to a facilitator and a fellow participant. That difference in the instructor's role dramatically changes course design and pedagogical practice in a MOOC. The fourth section drew a picture of MOOC learners by illustrating the impact of cultural identity on their learning behaviors. It also revealed learners' patterns of communication and participation in a MOOC and the influence of backgrounds on learning behaviors and performance. This section emphasized the shift of learner's role in a MOOC learning environment towards self-directedness and proactivity and performance expectations for them in the new role. Pedagogical considerations are concerned in this regard. The last section discussed instructional design issues in a MOOC, challenges to accommodate student learning needs in the design phase and other aspects of MOOC pedagogy.

The review of literature in Chapter 2 covers different aspects of MOOCs that provide relevant insights and understandings to approach the research questions. Chapter 3 details the methodology used for data collection and analysis.

Chapter III

Methodology

Background and Research Questions

The purpose of this study was to explore the perceptions of MOOC instructors and designers about the multicultural learners' needs and how these perceptions are manifested during the MOOC design phase. The study also described different instructional strategies that MOOC instructors and designers used to respond to the learners' needs in the MOOC learning environment. In addition, it examined pedagogical challenges that these instructors and designers faced when designing MOOCs for tens or hundreds of thousands of learners across the globe. In this chapter, the research population is described along with the instrument that was used to collect data. The research questions were:

- What were MOOC instructors' and designers' perceptions of multicultural learners' needs when designing MOOCs?
- What instructional strategies were used to address multicultural learners' needs in a MOOC learning environment?
- What were the pedagogical challenges that MOOC instructors and designers faced in determining and addressing multicultural learners' needs in a MOOC?

Research Design Overview

The study sought the answers to the above questions through different sources of data. The primary sources of data were interviews with MOOC instructors and designers who participated in the study. The secondary source of data came from content design

analysis on the investigated MOOCs done by the researcher, and other data sources or documents provided by the MOOC instructors and designers.

The first research question explored the perceptions of participating MOOC instructors and designers about how aspects of learners' multicultural backgrounds may shape their learning behaviors and needs, and how these perceptions guided them during the design phase of their MOOCs. The second question was dependent upon findings from the first question. That is, depending on their perceived understandings of the learners' needs rooted in their multicultural backgrounds, what instructional strategies did the instructors use to address the identified needs of the learners in the MOOC learning environment? The third question examined pedagogical challenges that these instructors and designers faced when taking into consideration or attempting to respond to the MOOC learners' needs in their course design.

Interview data for the study were categorized into three parts: 1) current state and goals of an institution in pursuing a MOOC and details about a specific MOOC, such as educational objectives, the target audience of the MOOCs and how the learning outcomes are measured, 2) the role of the instructor in a MOOC and how it develops, and 3) MOOC instructors' perceptions of the multicultural needs of the learners. Questions for these three parts are listed in the interview protocol, which is described in greater detail later in this chapter.

Target Population, Participant Recruitment, and Related Procedures

Target population. Qualified participants for this project were university professors and instructional designers or course liaisons who were currently working at an American institution of higher education and involved in designing or teaching at least

one MOOC on the Coursera platform by the time the interview took place. Their experience in designing and teaching a MOOC on Coursera was foundational to establishing insights on MOOC learners and their needs, as well as development of pedagogical strategies to address such needs. The names of the MOOC instructors were listed on the course page on the Coursera platform, whereas course designers or liaisons (i.e. the person who initiates and maintains communication between the MOOC instructor and the learners to spot issues and problems on the discussion forums and ensure actions to take place in time) are not. The faculty members teaching the selected MOOCs were from both public and private institutions with high academic reputations. These professors were recognized as having a high level of expertise in the subject (Ross, Sinclair, Knox, Bayne & Macleod, 2014).

Identification of qualified participants. Identification of qualified participants for the research interview involved multiple steps and were initiated on the Coursera MOOC platform. To filter the initial list the researcher clicked on the Coursera homepage and then on *Institution* and then choose *United States*. This resulted in a list of all American higher education Coursera partnering institutions who were offering MOOCs on this platform. Most of the MOOCs were listed on Coursera had specific delivery dates and duration. Qualified MOOCs for this study were the ones that had been offered by the time the interview was conducted. Once qualified MOOCs were identified, the search for the associated instructors and instructional designers and contact information began. Since the instructor's contact information was not revealed on the Coursera course page, a number of available search engines were employed, such as Google, LinkedIn or the university website to gather their contact information. Links to the MOOCs and other

related documents together with the names and contact information of the associated instructors were kept on an Excel spreadsheet.

Data sources. The first data source for this study included course design analysis of the investigated MOOCs, such as the course syllabus, including the subject, types of assessment, the calendar, discussion forums etc. The easiest way to obtain such information was from the course itself. The researcher signed up for the investigated courses in order to gain access to the information. This preliminary research was done prior to the interview process taking place.

The second source of data came from the interviews with the MOOC instructors and designers. The main data source of this part were the responses of the instructors to the interview questions, which were clustered by topic domains that were aligned with the research questions.

Instrumentation. Data were gathered in a semi-structured interview with an interview protocol that was composed of three topic domains. The first domain was background information on the institution and on the specific MOOC offered by the instructor being interviewed. Questions in this domain sought information on the institutional goals and current status of their MOOC development. Questions in this domain sought to discover the role of the instructor in the relevant MOOC and how it was developed, plus details about a specific MOOC being reviewed, including the title, educational objectives, target audience and the tools used to measure students' learning outcomes. These questions were adapted from the MOOC research study by Hollands and Tirthali (2014).

The second topic domain focused on the instructor's description of learners' demographic distribution and how the demographic recall might inform their prediction of their patterns of learning behaviors and their learning needs. It was speculated that learning needs of different groups of learners were closely related to their language educational background, or their employment status. For example, MOOC learners who were at medium level of English proficiency might experience certain language barriers and thus might expect some language support during the course, or learners who had never had experience with college education might appreciate detailed guidance to go through the course compared to the ones who owned a Bachelor's degree or above, or learners who were full time employees might appreciate a course schedule that would allow them to work around their work schedule.

The third topic domain investigated instructional strategies used by the instructors in addressing the learners' multicultural needs and pedagogical challenges they might face when doing so.

Modes and duration of communication. Interviews were primarily done online using a number of communication tools such as Skype, Google Hangouts, telephone, or any other tool suggested by the participants. Participants who participated in the interview were offered choices on the date, time and method of communication of their preferences. Once the candidate agreed to do the interview, a confirmation/reminder email was sent to the participant one or two days prior to the interview date. The interview normally lasted from 45-60 minutes. Follow up emails were used with the permission of the participants should there be points of discussion found on the transcript that needed clarification.

Data Collection

Merriam (2009), Stake (2006), and Yin (2014) suggest using more than one method for collecting data. For this study, data were collected from a secondary research on the MOOCs provided by the participants on the Coursera platform and from semi-structured interviews on the participants. The data collection happened in four phases as follows:

Phase 1 – Participant recruitment. This phase of recruiting participants for the interview was divided into several repeated rounds because of the large population pool. Each round included the following steps: 1) sending invitation emails to a set of qualified candidates, 2) responding to email responses from the participants, and 3) collecting the consent forms and negotiating/scheduling the interview time with the participants who agreed to participate.

Qualified candidates were invited to participate in the study via email. Twenty five candidates were selected at a time from the master list of the MOOC instructors and designers and sent the email invitation. Invitational emails were sent using Gmail merge. The email included a salutation, a brief introduction of the researcher's background and a short description of the research topic. It also offered the candidates a choice of modes of communication and informed them of an estimated duration for the interview. If the candidate agreed to participate in the study, they signed the consent form that was attached to the invitation email and return it to the researcher either via snail mail or email. For the sake of time management, the researcher set a timeframe of one week to expect responses from the candidates. The date the participants were expected to respond were highlighted in the invitation email. Since the interview date and time were up to the

participant to decide, the first cohort of interviews took place during the time period when the second set of invitation emails were sent out. The duration for the data collection phase was eight months starting when the first set of invitation was sent out, and finishing when the last interview was done.

Phase 2: Examination of the MOOCs on Coursera. The secondary research was done on the MOOC(s) provided by the instructor(s) and/or course designer(s) who agreed to participate in the interview and thus was conducted after the candidates agreed to participate. Data included the study of the overall course design structure, from the course syllabus and layout, such as course content modules, assignments, grading and how discussion forums are monitored, etc. This secondary research gave the researcher an opportunity to build knowledge and understanding about the MOOC prior to starting the interview. Investigation of the course formats also gave the researcher insights for an in-depth conversation with the instructor and/or designer, as well as to generate questions that can clarify parts of the course that were not found on the MOOC platform itself.

Phase 3: Semi-structured interview. Semi-structured interviews were conducted with the candidates who agreed to participate. Since most of the participants resided outside Houston, online modes of communication such as Skype, Google Hangout, or phone call were mainly used for the interview. Merriam (2009) suggested interviews should be recorded in order to keep original data for future analysis. For this study, the candidates could decide whether they would like to have the conversation recorded and/or published or not by indicating their choice on the appropriate check box on the consent form. The suggested time slot for each interview was approximately 45-60 minutes, and was subject to change/negotiation by the participant. It started with

salutation, a quick self-introduction of the researcher and the study before proceeding to the main conversation. At the conclusion of the interview, the researcher expressed appreciation to the participant for participating in the study and sought permission to carry on follow up communication should transcript clarification be needed or further details be inquired.

The interview did not always follow the sequence of questions that are listed in the protocol. The order of questions to be asked was determined by the circumstance of each participant. The interviewer as the researcher observed and made an assessment of how the participant presented themselves, their insights and their interests in the MOOC subject at the beginning of the interview to determine which questions to ask first from the protocol. Time allowance provided by the participant, the flow and pace of the conversation and the participant's subject knowledge also contributed to the decisions about which questions were asked and the order in which they were asked. For example, some questions were not asked during the interview if the information could be found on the MOOC platform on Coursera or written resources found online. In another case, if the time offered by the participant was significantly less than the estimated interview duration of 45-60 minutes, the researcher was very selective about the questions to be asked.

Phase 4: Artifact review. Resources for artifact review were the interview data and the secondary examination of the associated MOOC(s) done prior to the interview. After each interview, the researcher compared the secondary research artifact (i.e. the examination on the associated MOOC(s)) with the data gathered during the interview to possibly mutually validate the two sources of data.

Data Analysis Procedures

This study followed the steps of analyzing qualitative data proposed by Stake (2006), which included preparing and organizing data, reviewing and exploring the data, coding the data into categories, building themes and testing finding, and reporting and interpreting the data. These steps are described below.

Preparing and organizing data. All collected data were kept as individual participant cases for review and unification for the study as recommended by Stake (2006) and Yin (2014). Yin also suggests creating a case study database in order to maintain a one-stop-shop of evidence. For this study, the case database included the secondary research results, the interview transcripts, and other related documents found online or provided by the participant.

Interviews. Following Merriam's (2009) recommendation, each interview record was transcribed into a written format so that it could be reviewed by the participant for accuracy. Transcripts were sent via email to the participants for review and approval.

Documentation. Documents collected online or provided by the participants were scanned and kept as electronic formats in the individual cases for future use. The authenticity and accuracy of these documents were verified and compared to data collected during the interviews (Yin, 2014).

Artifact. In order to examine the accuracy of the artifacts, the researcher took a completely observational role by signing up for the MOOCs that were offered by the participants. The researcher then documented the content and layout of the MOOC from the learner's point of view and correlated these data with the primary data provided in the interview.

Coding data into categories. After the interview transcripts were viewed and approved by the participants, they were reviewed by the researcher for an overall understanding of the data and for placing the data into themes and categories. Data were kept by individual cases in the collective case database (Merriam, 2009; Stake, 2006).

A code for major categories was developed for each interview transcript after it went through review and approval. A code list of categories was created from the contribution of categories from each interview after they were coded. The researcher ran the review of interview transcripts again to make sure every code and categories from all the interviews were included. Interviews were coded by broad categories such as: institutional strategies of MOOC development; development of a specific MOOC; MOOC learners' demographic distribution; effects of demographic factors on students' learning behaviors and needs; and instructional strategies used to address the needs.

Build themes and test findings. In-depth analysis of the categories emerged during the coding process. These categories were aligned to major themes that were in turn aligned to the research questions. The purpose of the alignment was to determine if the data collected would provide insights and understanding that would answer the research questions.

Following the process described by Stake (2006) and supported by Merriam (2009), each case interview suggested a list of individual themes. These themes were run across all the interview cases for findings that may be true for the cases.

Report and interpret data. Using Stake's process (2006), collected data were reported both by individual cases and in a consolidated fashion. Cases were described generally enough in order to avoid revealing individual participants' identity but in the

meantime provided sufficient details so that conclusions could be drawn for the reader (Merriam, 2009). Data were interpreted in light of themes and assertions found from each participant and were combined to provide the research findings that answered the research questions (i.e. MOOC instructor's and designers' perceptions on MOOC multicultural learners' needs, instructional strategies used and pedagogical challenges encountered by them in addressing those needs).

The study placed heavy reliance on the participants' responses to the interview questions, which was determined by their knowledge about MOOCs and their MOOC teaching experience, and the researcher's ability to elicit such insights. These were the main parts of the data compiled in this study. The subsequent analysis of the responses required the information provided by the participants to be complete, accurate and truthful. The artifact review process helped to mutually verify and clarify the two sources of data collection.

Credibility

According to Lodico et al. (2010), credibility is defined as "whether the participants' perceptions of the setting or events match up with the researcher's portrayal of them" (p. 169). For this study, methodological triangulation (Merriam, 2009; Stake, 2006; Yin, 2014) was used to verify credibility and validity of the collected data by collecting data from different sources such as secondary research, interviews and other resources. The review of documents and artifacts not only confirmed the validity of the interview responses but it also shed light on additional interpretations that might not be presented in the interview (Stake, 1995).

Chapter Summary

This qualitative research study used interview research methods and targeted instructors and course designers at American higher education institutions who had offered at least one MOOC on the Coursera platform. The study sought to understand these instructors and course designers' perceptions on the multicultural backgrounds of MOOC learners', their learning behaviors, and their learning needs that emerged from their diverse backgrounds. It also examined the use of various instructional strategies used by MOOC instructors and designers to respond to MOOC learners' diverse learning needs.

Sections in this chapter described the steps taken in this study to carry out the data collection and data analysis process, and the strength and limitation of the approaches in use. In Chapter 4, the researcher discusses the data in greater detail and provides an in-depth analysis of what occurred during each step of the process.

Chapter IV

Data Analysis and Results

Introduction

The purpose of this study was to describe the perceptions of MOOC instructors and designers regarding multicultural learners' needs in their courses and how those perceptions are manifested in the design phase of the MOOC. The study also examined the perceptions of these instructors and designers about the pedagogical challenges when designing the MOOCs for learners across the globe. In addition, the study explored different instructional strategies that MOOC instructors and designers used to respond to the learners' needs in the MOOC learning environment.

Chapter 4 includes the following three parts. The first part provides a review of research design and detailed description of the participants, including their professional profiles, their roles in the design and development of the MOOCs. The second part presents a description of the investigated MOOCs and aspects of course design that addressed multicultural learners' needs. The third part reports the findings including a description of the diverse audience that the MOOCs served, the instructor's and instructional designers' perceptions of multicultural learners' needs and instructional strategies used to address such needs, as well as the pedagogical challenges they faced when pursuing the goals. The interview data reflecting the instructors' and designers' concerns and instructional strategies that addressed multicultural learner's needs are presented in three themes (i.e. language, content, and engagement) and were cross compared with evidence in the course design.

The research questions of the study were as follows:

- What were MOOC instructors' and designers' perceptions of multicultural learners' needs when designing MOOCs?
- What instructional strategies were used to address multicultural learners' needs in a MOOC learning environment?
- What were the pedagogical challenges that MOOC instructors and designers faced in determining and addressing multicultural learners' needs in a MOOC?

Review of Research Design and Data Collection

Review of research design. This study followed a qualitative interview methodology that included interviews with participants who had been involved in design and delivery of MOOCs using an interview protocol prepared by the researcher. Data analysis included examining the design elements of MOOCs that addressed multicultural learners' needs, analysis of the interview data by categories and themes, and cross comparison between the interview data and course design evidence. Documents provided by the participants added additional data detailing the design and development of MOOCs at the institutions in general and specifically on the topic being presented.

Data collection. Data collection started in July 2015 and ended in March 2016. Qualified candidates were instructors or designers in an American higher education institution who had been involved in teaching a MOOC, who had received an informed consent form that explained the purpose of the study, the expected time commitment for the interview, possible (zero) risks associated with participating in the study, a statement of confidentiality, and contact information of the researcher and the researcher's mentor. Participants who accepted the interview invitation signed and returned the consent form by email (scanned file) or snail mail. They also indicated in the consent form whether

they would allow the interview conversation to be recorded and whether the recorded information could be openly used for this study and publications. Estimated amount of time commitment for each interview was determined as 45-60 minutes and was subject to change based on the participant's availability. The date and time for the interview was decided by the participant.

Description of the Participants

Demographics. Qualified participants for this study included instructors and instructional designers in American higher education institutions who had been involved in designing, developing and delivering MOOCs by the time the interview was conducted. Participants were recruited via email and took part in the interview via online communication with the researcher.

There were a total of 249 invitation emails sent to candidates who were qualified to take part in the study. Among the 249 sent invitations, 197 candidates did not respond, three failed to deliver due to obsolete email addresses, eight automatic replies were received and resulted in no further communications from the candidates, 19 declined to participate with different reasons which could be categorized as 1) interested but unable to offer such a time commitment, 2) interested but did not believe to have sufficient expertise on the topic to provide valuable insights and, 3) disagreed on the value of the topic (one candidate). This candidate believed that "there is only one culture-computer nerd. It does not matter where you were born, your gender, skin color, religion, or whatever" (a professor from Stanford University). Seven candidates initially agreed to participate but did not proceed to scheduling an interview. Fifteen candidates agreed to participate and proceeded to complete scheduled interviews. The participants who took

part in the interview process of this study represented a diverse set of institutions and organizations from the public and private sectors as well as a diverse range of experiences with MOOCs and the subjects they taught. Most of the participants earned a Ph.D. degree at an accredited higher education institution in North America except for Participant 5 who earned his Ph.D. degree in Austria, Europe. Their years of work experience after earning the Ph.D. widely varied ranging from 5 to 50 years. Table 2 shows the demographic data of the participants as well as the subjects and categories of the MOOCs that they taught. For further information of the background and qualifications of the participants, please see the Appendix B for their professional profiles.

Table 2

Demographic Data of the Participants

Participant	Highest Degree	Years of Exp.	Academic Rank	Institution	Research interest(s)	MOOC title	MOOC category
1	Ph.D.	31	Professor of Astronomy	California Institute of Technology	Extragalactic astronomy, cosmology, galaxy formation	Galaxies and Cosmology	Science/physics
2	Ph.D.	15	Assistant Research Professor	Duke University	Cell Biology	Introduction to Human Physiology	Life science/biology
3	Ph.D.	43	Associate Research Professor		Cell Biology cell/systems physiology		
4	Ph.D.	34	Associate Professor	Duke University	Neurobiology	Medical Neuroscience	Life science/medicine and healthcare
5	Ph.D.	5	Adjunct assistant research scientist	University of Maryland	Web survey; visual design effects	Questionnaire Design for Social Surveys	Social Science/ Psychology
6	Ph.D.	8	Assistant teaching professor	University of California-San Diego (UCSD)	Theory of computation, algorithms, and problem solving	Specialization in Intermediate Java Software Engineering*	Computer science/software development
7	Ph.D.	11	Education Director Research affiliate	University of Maryland	Countering Violent Extremism Resilience	Understanding Terrorism and the Terrorist Threat	Social Science
8	Ph.D.	23	Associate professor	University of California-San Francisco	Genome Precision medicine	Genomic and Precision Medicine	Medicine/ Biology & Life Sciences

(Continued)

Participant	Highest Degree	Years of Exp.	Academic Rank	Institution	Research interest(s)	MOOC title	MOOC category
9	Ph.D.	50	Professor emeritus of history	University of California-Santa Cruz	Russian history, Eastern Europe, 20th-century Europe, Soviet film	The Holocaust: The Destruction of European Jewry	Arts and Humanities/ History
10	Ph.D.	--	Faculty of Education	University of New Mexico	History and lore of Curanderismo	Curanderismo Part 1: Traditional Healing of the Body	Medicine/Humanities/Health & Society/Food and Nutrition
11	Ph.D.	10	Clinical Assistant Professor	University of Michigan	Comprehensive Ophthalmology and Cataract Surgery	Introduction to Cataract Surgery	Life science/medicine and healthcare
12	Ph.D.	23	Associate Professor	University of Houston	Teacher training Educational uses of digital storytelling	Powerful Tools for Teaching and Learning: Digital Storytelling	Teacher professional Development
13	Ph.D., FNP-C	5	Assistant Clinical Professor	University of New Mexico	Nurse Practition	Rural Health Nursing	Life science/medicine and healthcare
14	Ph.D.	41	Professor of Economics	University of Wesleyan	Economics, law, history and philosophy Historical development of social institutions	Property and Liability: An Introduction to Law and Economics	Social Science/Law
15	Ph.D.	43	Distinguished University Professor	Case Western Reserve University	How do People Change, Learn and Grow Throughout Their Lives and Careers?	Inspiring Leadership through Emotional Intelligence	Business/ Leadership and Management

*This specialization included five courses: 1. Object Oriented Programming in Java, 2. Advanced Data Structures in Java, 3. Mastering the Software Engineering Interview, 4. Data Structures Made Easy, and 5. Capstone: Analyzing (Social) Network Data.

Roles in the design and development of MOOCs. Most of the participants in the study were instructors (except for Participant 5 who was a course liaison for the MOOC in the joint program between the University of Michigan and university of Maryland) who designed and delivered the MOOCs that were developed from the similar courses they taught at their institutions. As the MOOC instructors, their roles in the design and development of the MOOCs varied ranging from taking charge of everything such as designing, developing, filming, running, debugging with or without the help of the campus-based Information Technology (IT) team (four participants) to collaborating with the team to build a series of (specialization) courses (9 participants). The involvement of the instructors as well as the degree of collaboration and teamwork in the design and development of the MOOCs were determined by the way the campus-based courses were structured, and by the resources and pedagogical concerns that the instructors had. It is notable that some instructors were involved in more than one role when designing and developing the courses. Figure 2 shows different roles the participants played in the design and development of the Coursera MOOCs in their institutions.

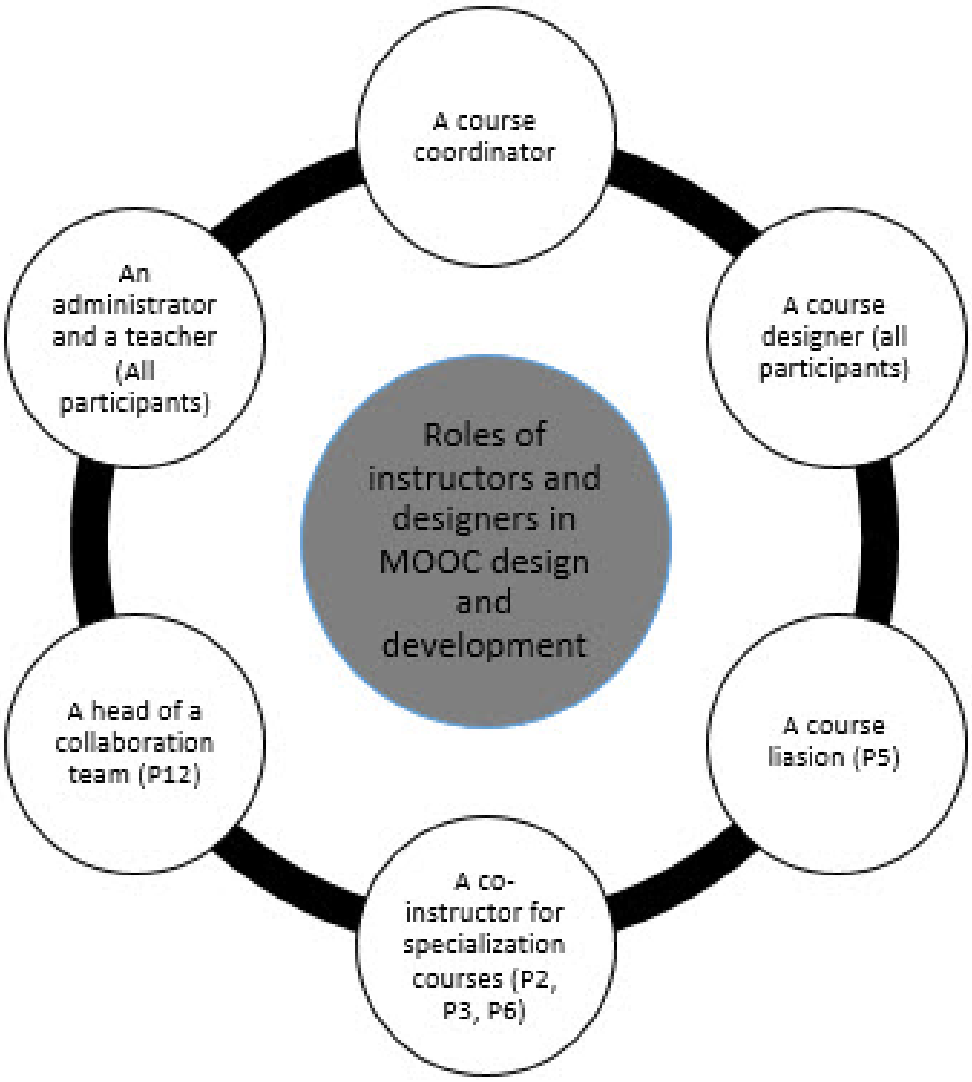

Figure 2. Roles of Instructors and Designers in MOOC Design and Development.

A course designer. As all of the participants were the content experts in the MOOCs that they offered on Coursera, they played the role of course designers in the development process of the MOOCs to make the design and delivery choices of the course content. Depending on the institutional situation or the expertise of the labor force that was available, an instructor could play the role of a solo course designer who did everything to prepare for the course as shown in this quote:

> My role? Designing, developing, filming, running, debugging, everything. I feel that professors have to experiment more with pedagogy because on a whole, the amount of learning that people have from higher education, college courses, graduate courses are very low. People retain very little more than a few weeks later. And I also felt that we are getting too high priced. And we have to dramatically reduce the cost and we had an experimentation with pedagogy. We have to break that. So the MOOCs team was an interesting thing to try. I recorded a few online videos and did not know what to do with it and then this was for a project and then the CIO of our university approached me and said (this was a little over two years ago) that we were about to become a partner with Coursera. And he and the president of the university asked if I and one other faculty member who is a co-dean of Law school, would each do a MOOC as the inaugural MOOC.

It started with the instructor's profound pedagogical concerns to build the MOOC. The participant described himself as a staunch adversary in online learning. According to him, whether people learn math, or interpersonal abilities or psychology, the keys were emotions and relationships and a lot of professors don't understand that because they were not psychologists and they did not understand learning. He raised the questions as how to develop relationships online, how to get the learners emotionally involved when what working with the computer. Before deciding to offer a MOOC, the participant reflected on his long-established expertise in the psychology field to understand how to address the different learning styles, and struggled with the problem of how to get people to build relationships and how to get people to be emotionally involved besides watching the lecture videos.

A course coordinator. In another case, the participant played the role of a course designer who also coordinated with other instructors to build the course content.

> I was more of like a course coordinator in a way because we already have a course that we did live at our university once a year…a variety of different physicians would take a topic and lecture on it but we never really had enough time to do every single lecture that we wanted to do…So, one of the purposes of the MOOC was to be able to have every single lecture available for the residents

> to listen to on their own time…and what I did was I sort of put together a syllabus of all the lectures that we wanted to include…I talked to the physicians that were already giving those lectures and asked them if they would mind recording them…for this course I was giving a couple of the lectures…so, it's just a lot of coordination in putting it together…I also developed the homework assignments, which were basically quizzes that just quiz students on the materials that were covered in the lectures, and I did a pre-test and a post-test…so, basically putting the course together…I did not do most of the lectures, that was spread out among many people.

An administrator and a teacher. As a result of being the content experts of their MOOC subjects, most of the participants were engaged in their MOOCs as an administrator and/or teacher during the delivery of the course. An example of this role description was given as follows:

> My role in the course was to administer it. There were six weeks in the class and the syllabus was divided into 6 parts, one part per week. The lectures would be published Monday morning and so every Sunday night I would send out to everybody in the course a message on the message board and an email that introduced the week's readings. And if I've seen in the previous week that if people were interested in a particular aspect of it, I would bring it to class discussion. I also put suggested readings on the weekly message for people who wanted to do them although I'd organize the course so that nobody would have to do any readings at all. It wasn't required. Then I would spend maybe 45 minutes to an hour, four or five times during the week in the chat room and most of the time I wouldn't say anything. I just read what people were doing. Occasionally somebody would address something specifically to me that I thought needed to be addressed then I responded to that for everybody and I guess I didn't do anything other than that. I like being in the chat room. That gave me the feeling of being connected to the students.

A head of the collaboration team that involved doctoral students. As said, the design of MOOCs could be done by an individual instructor with or without the support of an IT team from the institution or from Coursera. The collaboration usually (but was not limited to) happened among the instructional designers and faculty members who were the content experts of the MOOCs. At the University of Houston, the two

instructors in the Curriculum and Instruction department collaborated with their doctoral students to build a series of six MOOCs for the professional development of K-16 teachers using the "Webcapes" model (Robin & McNeil, 2015). The model can be understood as a design-based research project that focuses on improving educational practices, promoting reflection, and encouraging collaboration between researchers and practitioners in real-world settings (Wang & Hannafin, 2005). The instructional design process of the model was described as reflective and recursive that involves non-linear, organic, developmental and collaborative planning (Willis, 1995). It allows students, faculty and content experts to work collaboratively in small teams to develop multimedia-rich content projects, use a range of technological tools and resources to create actual projects that could be used by teachers and students around the world.

> My role is to be the head of the team. I worked with the other faculty members and with some of our doctoral students to develop the MOOCs and basically develop it out of a long standing interest of teaching online. I work in the Learning, Design and Technology program area and we have doctoral students who work in one of the labs while they are pursuing their doctoral degrees. We thought that it would be a very good educational experience for them to not only learn about what MOOCs are but learn how to design and deliver a MOOC so they are instrumental in helping us put a MOOC together and then putting them on Coursera, delivering them, participating in the discussion, the peer assessments and the feedback to students and the evaluation. What we did for the MOOCs was to take a condensed version of a typical 15-week long course (or 5-9 weeks long in the summer) and turned it into a short version, a kind of preview version of what the students would get in one of the full courses that they enroll in.

A co-instructor responding to Coursera's call for proposal to develop specialization courses. The participant was one of the three instructors who offered a series of five specialization courses in Intermediate Java Software.

> It started with my two colleagues and I answered the call for proposals from Coursera to develop one of their specializations. Coursera recently made a push to

> offer specializations which are courses that are designed to be taken in sequence and combined the capstone project or capstone course. So they were seeing the students from going to their platform and really enjoying some courses but then want to get deeper to a subject so they wanted to give these certificates that somehow verify that the student progressed through a few courses and accumulated some more coherent body of knowledge. And so, they did some more research with topics which would be interesting for their learners and so our courses were listed on the proposal for the specializations. So my two colleagues and I put in the proposal and when it got accepted, the three of us have co-designed, co-taught and co-run the courses.

Also as co-instructors, the participants shared the workload among themselves with the support from the Coursera IT team to record the content videos. At Duke University, there is a Center for Instructional Technology that involved technological course liaisons for Duke and Coursera to assist Duke faculty members in developing MOOCs. The team demonstrated deep knowledge of the features of the implemented platforms and could also offer suggestions on how to use online tools to achieve instructional goals.

> So we started this MOOC based on an in-house course of "Introduction to Human Physiology" and I teach it with another individual whose name is _____. When we were offered the opportunity to make this a MOOC we decided to go ahead and do it so _____ did one third of a course and I do about two thirds of a course. We had to record all the videos for the MOOCs and in order to do that Duke has what they call the Coursera IT (CIT) who provided technical support. They could video tape us. But since we taught in the medical school so we used the recording system that we had at the medical school for making the videos and I hired a student to do the editing for the audio portion of the video. And to do that, the Duke CIT department gave us a grant so we had the money and we could hire people to help and videotaping us and then editing.

A course liaison. This was the case of one of the participants who was not the course instructor and who joined the MOOC management team after the course was designed. The MOOC was one of the series of seven specialization courses offered as a

pilot test for creating online courses for the joint program between the University of Michigan and the University of Maryland.

> I am working closely with both the instructors in the course "Questionnaire Design for Social Survey" and "Survey Data Collection and Analysis". Our first MOOC has been running for four times now I think. It runs for 6 weeks for three times a year. I work closely with the instructors and the team over those re-runs to modify it. I need to explain that I was not on board when they put the MOOC together. I came in a later time during the second run. So I wasn't in charge of anything that had to do with the setup of the MOOC. But I am in charge of everything that has to do with fixing or making the MOOC better. So I am kind of the eyes and ears of the instructors, to notify of what's working well and what's not working. I am the first person that is contacted if the students complain or have some issues or something's going on based on what the discussion is going on the discussion forums, or is there any problem I am the person who sees that. When the MOOC was running I browsed the discussion forums daily to see what's going on there and what people were talking about and trying to fix any problems. After each round of the MOOC we got back together and reflected on what went well and what did not go that well and tried to fix things that didn't work.

Description of the Investigated MOOCs and Aspects of Course Design that Address Multicultural Learners' Needs

Description of the investigated MOOCs. As mentioned above, most of the participants in this study were involved in designing and teaching the MOOCs on the Coursera platform. The information of the investigated MOOCs associated with the participants including the course name, course description, course length, whether it was part of specialization, and institution presented in the tables below were copied directly from the Coursera or the MOOC list websites. For further information on the course, please see the attached appendix C for screenshots of the course descriptions with the web link that appeared on the Coursera or the MOOC list websites.

Table 3

Description of the Investigated MOOCs

Participant		Description of the investigated MOOCs
1	Course name:	Galaxies and Cosmology
	Course description:	*This class was an introduction to how the universe evolves, and how to get to know that. It introduced the modern extragalactic astronomy and cosmology, the part of astrophysics that dealt with the structure and evolution of the universe as a whole, and its major constituents.*
	Course length:	10 weeks
	Part of specialization:	No
	Institution:	Caltech
2 & 3	Course name:	Introduction to Human Physiology
	Course description:	*Physiology is an integrative science which considers the function of each organ and organ system and their interaction in the maintenance of life. This course was intended for individuals with a basic background in biology.*
	Course length:	10 weeks
	Part of specialization:	No
	Institution:	Duke university
4	Course name:	Medical Neuroscience
	Course description:	*It included all of the core concepts in neurophysiology and clinical Neuroanatomy that would be presented in most first-year neuroscience courses in schools of medicine and was designed for first-year graduate students in the health profession programs. It was meant to provide understanding of human brain anatomy and insights into how ongoing discovery in neuroscience was shaping clinical practice.*
	Course length:	12 weeks
	Part of specialization:	No
	Institution:	Duke university

(Continued)

Participant		Description of the investigated MOOCs
5	Course name:	Questionnaire Design for Social Survey
	Course description:	*This course covered the basic elements and different stages of designing and evaluating questionnaires: developmental interviewing, question writing, question evaluation, pretesting, and questionnaire ordering and formatting. It reviewed the literature on questionnaire construction, the experimental literature on question effects, and the psychological literature on information processing and the effects of essential design features on questions and questionnaires.*
	Course length:	Six weeks
	Part of specialization:	This course was the third in the series of a seven-course specialization (i.e. six courses and a final capstone project) that covered the basic elements and different stages of designing and evaluating questionnaires: developmental interviewing, question writing, question evaluation, pretesting, and questionnaire ordering and formatting.
	Institution:	University of Maryland and University of Michigan
6	Course name:	Object Oriented Programming in Java
	Course description:	*It presented some core algorithms for searching and sorting data and allowed the learner to explore how to divide up a large project into a hierarchy of classes and how to increase the functionality of their projects by importing existing libraries.*
	Course length:	Six weeks
	Part of specialization:	This course was part of the series of five specialization courses in Intermediate Java Software Engineering
	Institution:	University of California, San Diego
	Course name:	Advanced Data Structures in Java
	Course description:	*This course presented the key pieces of data in a complex data structure. In this course, learners would learn about real world data structures such as graphs and develop, implement, and analyze algorithms for working with this data to solve real world problems.*
	Course length:	Five weeks
	Part of specialization:	This course was part of the series of five specialization courses in Intermediate Java Software Engineering
	Institution:	University of California, San Diego
	Course name:	Mastering the Software Engineering Interview
	Course description:	*This course is about mastering the software engineering interview. Learners will combine all of the technical skills they have learned in their software engineering career and apply them to stand out in the interview process. With the support of Google's recruiting and engineering teams, this course provided tips, examples, and practice opportunities that helped learners launch a job with a number of technology companies by assisting them to organize into teams to practice job interviews.*

(Continued)

Participant		Description of the investigated MOOCs
	Course length:	Four weeks
	Part of specialization:	This course was part of the series of five specialization courses in Intermediate Java Software Engineering
	Institution:	University of California, San Diego
	Course name:	Data Structures Made Easy
	Course description:	*This course aimed to answer the question of how Java programs dealt with vast quantities of data, how to deal and process real, large data sets and how to achieve and measure efficiency.*
	Course length:	Five weeks
	Part of specialization:	This course was part of the series of five specialization courses in Intermediate Java Software Engineering
	Institution:	University of California, San Diego
	Course name:	Capstone: Analyzing (Social) Network Data
	Course description:	*This capstone project combined all of the skills from all four specialization courses to do something fun and offered endless learning opportunities: analyze social networks!*
	Course length:	Six weeks
	Part of specialization:	This course was part of the series of five specialization courses in Intermediate Java Software Engineering
	Institution:	University of California, San Diego
7	Course name:	Understanding Terrorism and the Terrorist Threat
	Course description:	*This course brought insights of the who, what and how of Terrorism Studies and introduced learners to cutting-edge research from the social and behavioral sciences and the experts investigating these topics.*
	Course length:	Six weeks
	Part of specialization:	No
	Institution:	University of Maryland
8	Course name:	Genomic and Precision Medicine
	Course description:	*This course provided learners with some baseline knowledge of genomics, an overview of the clinical applications of genomic medicine, the skills to evaluate the clinical validity and utility of new tests, and an appreciation of the associated ethical and social issues inherent in the field.*
	Course length:	Seven weeks
	Part of specialization:	No
	Institution:	University of California, San Francisco

(Continued)

Participant		Description of the investigated MOOCs
9	Course name:	The Holocaust: The Destruction of European Jewry
	Course description:	*This course provided the learners with the insights of the Holocaust from the overlapping perspectives of literature and history—through memoirs, historical documents, poetry, documentary footage, filmic representations, and novels.*
	Course length:	Eight weeks
	Part of specialization:	No
	Institution:	University of California, Santa Cruz
10	Course name:	Curanderismo Part 1: Traditional Healing of the Body
	Course description:	*This course provided information on the history, traditions, rituals, herbs, and remedies of Curanderismo, a folk healing tradition of the Southwestern United States, Latin America and Mexico.*
	Course length:	Six weeks
	Part of specialization:	This course was the first of the series of three courses on Curanderismo: Traditional Medicine of Mexico and the Southwest of North America.
	Institution:	University of New Mexico
11	Course name:	Introduction to Cataract Surgery
	Course description:	*This course provided the fundamentals of how to successfully perform each step of cataract surgery. It began with the pre-operative evaluation of patients with cataract surgery and explained the mechanics of cataract surgery by phacoemulsification and extra capsular cataract extraction.*
	Course length:	Four weeks
	Part of specialization:	No
	Institution:	University of Michigan
12	Course name:	Powerful Tools for Teaching and Learning: Digital Storytelling
	Course description:	*This course introduced educators, especially Texas K-12 teachers, to aspects of digital storytelling and explores ways to use digital stories to enhance their learning experience.*
	Course length:	Five weeks
	Part of specialization:	No
	Institution:	University of Houston

(Continued)

Participant		Description of the investigated MOOCs
13	Course name:	Rural Health Nursing
	Course description:	*This course provided learners with an opportunity to explore the challenges, opportunities, and skills necessary to provide nursing care in rural areas without requiring them nursing or health professional backgrounds to participate.*
	Course length:	Eight weeks
	Part of specialization:	No
	Institution:	University of New Mexico
14	Course name:	Property and Liability: An Introduction to Law and Economics
	Course description:	*Property and contract provide the institutional scaffolding that makes free exchange in markets possible, while the liability systems of tort and crime appear to mimic market exchange in areas of human activity where free exchange itself is not possible. This course sought to expose this underlying economic logic through the close investigation of a series of paradigmatic problems and examples in light of some simple but very powerful economic ideas.*
	Course length:	Six weeks
	Part of specialization:	No
	Institution:	Wesleyan University
15	Course name:	Inspiring Leadership through Emotional Intelligence
	Course description:	*This course allowed students to learn about concepts and skills to inspire and engage others for performance, innovation and satisfaction.*
	Course length:	Eight weeks
	Part of specialization:	Part of a 5-course series, the Inspired Leadership Specialization
	Institution:	Case Western Reserve University

Aspects of course design that address multicultural learners' needs. Aspects of course design that assisted learners of diverse backgrounds included language support for learners who spoke English as a second/foreign language and the way the course was formatted that facilitated a social learning environment and provided extra assistance for learners to access and comprehend the content. Commonly for the language support service, the instructors and course designers adopted the built-in Coursera features, such as subtitles of video lectures, or provided translation of the video lectures into different languages. Customization of the course format that supported diverse needs of multicultural learners included the employment of 1) multiple discussion venues such as a Facebook page, virtual office hours, 2) meet-and-greet sessions, 3) Google Hangout, 4) mentor/teaching assistant support for discussion and grading, and 5) use of PowerPoint/visual aids/study guides accompanied with the video lectures.

Table 4

Aspects of Course Design that Address Multicultural Learners' Needs

Courses	Language support	Course format				
	Translation/ sub-title	Multiple discussion venues (Coursera, Facebook page, virtual office hours)	Meet-and-greet/ general discussion	Study groups/ Google Hangout	Teaching assistant	PowerPoint/ study guides
Galaxies and Cosmology	x	x	x	x	x	x
Introductory Human Physiology	x	x	x	x	x	x
Medical Neuroscience	x	x	x	x	x	x
Questionnaire Design for Social Surveys	x	x	x	x	x	-
Object Oriented Programming in Java	x	x	x	x	x	x
Advanced Data Structures in Java	x	x	x	x	x	x
Mastering the Software Engineering Interview	x	x	x	x	x	x
Data Structures Made Easy	x	x	x	x	x	x
Understanding Terrorism and the Terrorist Threat	x	x	x	x	x	x

(Continued)

Courses	Language support	Course format				
	Translation/ sub-title	Multiple discussion venues (Coursera, Facebook page, virtual office hours)	Meet-and-greet/ general discussion	Study groups/ Google Hangout	Teaching assistant	PowerPoint/ study guides
Curanderismo Part 1: Traditional Healing of the Body	x	x	-	x	x	x
Introduction to Cataract Surgery	x	-	-	-	-	x
Powerful Tools for Teaching and Learning: Digital Storytelling	x	x	x	x	x	x
Rural Health Nursing	x	x	x		x	x
Property and Liability: An Introduction to Law and Economics	x	x	x	x	x	x
Inspiring Leadership through Emotional Intelligence	x	x	x	x	x	x

Findings

Goals for developing the MOOCs

Before unfolding how the instructors and instructional designers perceived and responded to multicultural learners' needs in their MOOCs, it is important to review the goals of the MOOCs revealed by some of these participants, which are dynamic and somewhat set the tone for how they perceived and responded to MOOC multicultural learners' needs. The overarching and probably most common goal of MOOC pursuit by all the participants was to spread the reputation of the university and to assist people in learning about the topic. Also, it is important to note that these participants were attracted to MOOCs by more than one single goal.

Participants who were involved in this study were driven by a philanthropic impetus to offer a free gift to the community by creating a MOOC from a campus-based course that they had been teaching. It was in addition to what they were doing at their institution. Thus, they believed their MOOC could be improved and expressed the desire to do so in order to increase the course quality. However, they also expressed the constraint time commitment for MOOCs on top of their responsibilities at the institutions.

> I think we are all essentially kind of grapple through this and trying to learn how this all are going to work eventually because I think the education is really undergoing profound transformation, and I think most of my colleagues are in a complete denial about that. It'll be very interesting to see how this transformation unfolds. In _____ this is a voluntary activity and, you know, everyone is busy with their lives, and our institution hasn't invested into providing any additional things, this is sort of like a gift to the community…take it or leave it as it is…so, to go to a higher level of providing educational service, I think institutions will have to compensate people who are actually doing it…I've done it partly out of curiosity, and partly for just doing different things, and thought that it was a nice thing to do…but at some point, you know, I have actual work to do…So, the institutions have to come up with a reasonable mechanism, by which all this is organized.

Another participant also expressed a similar struggle she had between the desire to pay more attention to MOOC versus the constraints of time and other commitments.

> The MOOC is like a side thing that I am doing… I am doing my job like I always do and doing this on top of it… I was hoping to go through it really carefully and, maybe, change some lectures, add some lectures, definitely change some of the quiz materials, but I honestly haven't gotten through it yet, so I am not even sure what's going to happen…but that was my hope before the next offer, to be able to really go through it, and put a lot of thought into changing it…I haven't had the time to do that yet. I don't feel like this is my priority, I have to do my other stuff first and then the MOOC.

One of the MOOCs, *Questionnaire Design for Social Surveys* served as a pilot test for the development of an online joint program between two universities. The participant thought that the design and implementation of the MOOC was to some extent a pilot test for the whole process of creating an online program for regular students in the joint program.

MOOCs could be developed in response to a Coursera request to develop a specialization. This was the case of the series of five computer programming courses offered by one program. In another case, the MOOC was a means for offering professional development that targeted K-16 teachers in the state of Texas.

MOOC learners: Expectations and reality. Most of the participants in this study came to MOOC design and development with a mixed mindset in terms of who they expected for the audience. Specifically, many of them had a certain group(s) of learners in mind that they developed the MOOCs for, and, in the meantime, expected some version of diversity among the audience for their MOOCs. Having said that, a number of these instructors were surprised at the volume of diversity of their learner population and the tremendous diversity among them in terms of their age range; their

language, cultural, ethnical and educational background; and their patterns of engagement in the course. Below is a brief description of the MOOC expected audience and reality in terms of age, language background, and employment status by the instructors and instructional designers.

Table 5

Expectations and Reality of MOOC Learners' Backgrounds

Participant	MOOCs	Learners' Expected Backgrounds	Reality
1	Galaxies and Cosmology	Learners with expected background in: • Physics • Astronomy • Cosmology • Anyone interested	• 20% expected audience • 20% science education • 60% regular people • Age: 16 – 82 • All continents
2 & 3	Introductory Human Physiology	• Biology background • Anyone interested • Biology background • Anyone interested	Wide range of academic background: • Humanities: 15.1% • Natural science: 17.8% • Social science: 13.9% • Health science: 30.6% • Professional: 11.6% • Technical: 11% (Engle et. al. 2015)
4	Medical Neuroscience	• Doctors • Physicians • Those with neuroscience knowledge • Anyone interested	A lot of non-native speakers of English (who did or did not struggle with the language)
5	Questionnaire Design for Social Surveys	Students and professionals from all fields of social science	N/A
6	Specialization in Intermediate Java Software Engineering*	• Undergraduates around the world • Working professionals • Programming background	Diverse programming skill levels
7	Understanding Terrorism and the Terrorist Threat	U.S. Government officials (Homeland Security, Intelligence, Justice, etc.)	• 30% from developing economies • 30% from the U.S. • Subject expert (i.e. in search of network) vs. novice (i.e. to learn something new)

(Continued)

Participant	MOOCs	Learners' Expected Backgrounds	Reality
9	The Holocaust: The Destruction of European Jewry	Anyone interested	People who lived during the Holocaust time
10	Curanderismo Part 1: Traditional Healing of the Body	Anyone interested	• Mexicans • Tex-Mex
11	Introduction to Cataract Surgery	• Residents in the ophthalmology residency program • Anyone interested	• < 50% expected audience • >50% lay people
12	Powerful Tools for Teaching and Learning: Digital Storytelling	• Texas K-12 teachers • Anyone interested	• 1% Texas K-12 teachers • Everyone else
13	Rural Health Nursing	• Nurses • Broad audience	Global audience
14	Property and Liability: An Introduction to Law and Economics	Anyone interested	• 70% Americans • 30% internationals
15	Inspiring Leadership through Emotional Intelligence	Anyone interested	Global audience

*This specialization included five courses: 1. Object Oriented Programming in Java, 2. Advanced Data Structures in Java, 3. Mastering the Software Engineering Interview, 4. Data Structures Made Easy, and 5. Capstone: Analyzing (Social) Network Data.

Most participants believed the wide diversity of MOOC audiences served to enrich learning outcomes. A number of participants shared the belief that one great advantage of MOOCs was the diversity and authenticity of viewpoints, the many different experiences, and the personal stories brought by the learners. One participant stated that another advantage of MOOCs in terms of diversity was that the learners could support and encourage each other during the learning process.

Interestingly, participants also shared their thoughts about the merits of MOOCs regarding how well they served a global audience and the striking cultural differences among the audience's attitude, appreciation and satisfaction towards perceiving the course. The participants' interpretations of the learners' dynamic attitude towards their MOOCs somehow affected their dedication and involvement to MOOC designs regarding addressing the learners' needs. Below are some excerpts from the participants:

> One interesting thing that caught my attention is a lot of students, and I think most of them, are probably Americans…were having expectations that were not warranted by the fact…they're sort of feeling extremely entitled…demanding better service, and I had to remind people repeatedly that they are all guest, they are having a free gift, and they don't have to take it…it is what it is…they are not paying customers… and sometimes people take that too hard, but I was surprised…people just expect free goodies, free service, and complained when the entertainment isn't up to their satisfaction. On the other hand, there are a substantial number of students…and those are I think from places like India, or China, or South East Asia in general, or Africa…They were extremely grateful…They were thrilled to have the opportunity to actually participate in a _____ class from where they are.

To illustrate the point, the participant provided an anecdote of how a student from Egypt expressed their appreciation toward the MOOC.

> At one point, I got an email from a fellow in Egypt, who said "I am emailing you on behalf of my brother who is taking your class, but he cannot email you himself. And here is the fax: "Professor, I love your class, I am so sorry I will not

> be able to finish it because I was arrested by military police in Egypt during the demonstration, and I don't know when I will get out, but I am so sorry." I am thinking, "Good God, if I were arrested by military police in Egypt, _____ class will be the last thing in my mind." This person was so grateful that they had the opportunity that they took trouble to send this message from jail.

Another participant believed that MOOCs were more appreciated by the learners from parts of the world that had limited access to quality learning resources.

> The real value of the MOOC is not that some college sophomores are going to see it in America where the alternative is that the college sophomores could get it in a college class. It's going to be somebody in Vietnam or somebody in Peru or somebody in Africa for whom the alternative is not an American college course but nothing at all. And so for that student, this is an incredible opportunity. Yet many of them wrote to me to tell me it was the best part of the whole experience. They said if it wasn't for this I wouldn't have any idea of the subject that you're talking about and there's no opportunity in my life to do anything remotely like this and yet, cheerfully it just changed my attitude about it completely.

Yet another instructor provided evidence that the merits of MOOCs were attributed by the expertise and reputation of the instructor and the institution and the learners appreciated the opportunity to speak with the instructor.

> I try to do a live chat, about once a month. When I do the live chat people call in for an hour and a half on a video chat and they can ask any questions. The last calls were somebody from Tehran with questions, somebody calling from British Columbia, Canadian teacher who is on strike so she's at home. A young man from Amman Jordan, a high school student from the UK, a man and a woman both are working in Lagos Nigeria called and people from a few U.S. cities. So what becomes very…. Oh and a young man from India. It was 4 o'clock in the afternoon my time in Cleveland at the university and I said "What time is this there for you?" and he said "its 2:30 in the morning," I said "why aren't you in bed?" he said "Oh, professor, I've been waiting for so many weeks to be able to talk to you."

As indicated earlier in Chapter 3, findings of the study were presented in categories in which perceptions of the instructors and instructional designers on multicultural learners' needs were paired with the instructional strategies they used to

respond to the needs. There were themes under categories that indicated specific area of instructional strategies used to address multicultural learners' needs and to facilitate learning. The review of artifacts provided a cross comparison of the interview results (i.e. MOOC instructors and instructional designers' perceptions and responses to multicultural learners' needs) and such indications shown in the course design.

Category 1: Instructors and instructional designers' perceptions of multicultural learners' needs in a MOOC and instructional strategies used to address the needs.

Theme 1: Language. As indicated earlier, having a somewhat expected global audience for the MOOCs, most of the interviewed instructors and designers were mindful about the fact that there would be learners who spoke a different language than English among the audience. These MOOC instructors and designers believed that language played a role in MOOC learning outcomes, especially for the non-native speakers of English. Learners who were not so proficient in English faced more problems when drawn to a more specialized subject. This was the case of the *Introduction to Human Physiology* course offered by Duke University in which there were a lot of difficult terminologies. To master these terms was like learning another language and it posed many problems for learners with limited command of English. To solve this problem, the instructors called for support from the Teaching Assistants (TAs) who were their former MOOC learners and had the entire course translated into different languages such as Chinese and Portuguese by the TAs or individuals with a medical background. On this track, the instructors revealed that it was hard to assess but the course has been successful by its four runs and there were learners who kept coming back either because they did not

pass the first time or to help other people. The instructors shared a confession in the Google Hangout section made by their student who attended the course four times as follows:

> "My English language was not very good I am trying to learn because I want to get into the medical school" said the student. In the second run he spoke more fluently. His English was really improved and by the fourth run he got on and he said "oh I got into the medical school I am so excited that this course has helped me so much" and he was really selling our course. We really thought it was funny. It was really animated. It's very nice. He said that the course helped him both to learn English as well as to master the information he needed to get into medical school.

Other instructors provided a number of language support strategies to help the learners overcome the language barriers. Besides the subtitles for the video lectures provided by Coursera, all the MOOC instructors provided transcripts and/or translation for their video lectures. Translation of the video lectures (into how many languages) varied depending on the popularity of the MOOC and on the available labor force that they could recruit to do the translation. For example, some participants recruited volunteer TAs who were their former MOOC learners to do the translation of the video transcripts or monitor discussions on the discussion forum. Furthermore, most participants provided their PowerPoint slides during their video lectures so that the learners could read the slides while listening to the lectures. Others spoke slowly and clearly in the video lectures, which was deeply appreciated by their MOOC learners who were non-native speakers of English.

> I've had the experience myself of being a non-speaker in a foreign country and been struggling to learn German for my whole life so when I was in Germany I appreciated that people speak German to me slowly and clearly and at my University I have many foreign students. Many of them are not native English speakers and so for years I've been conscientious that what they need is for me to speak clearly and slowly. I don't talk to my wife this way but whenever I am

> speaking I am aware that not everybody is a native English speaker and for those people you need to speak slowly and clearly because that's how I need to understand the language that is not perfectly spoken to me. So one of the nicest things about my course was people in places like Burma would send me an email on the chat board to say "thank you for speaking slowly and clearly" and that made me feel great.

A special support to learners of diverse language backgrounds was reflected in the series of five specialized MOOCs offered at University of California at San Diego.

> One of the things that we have done is we have given the option for learners to upload their videos in whatever language they prefer rather than English with provided that if there aren't enough learners who speak that language, they might not be able to be graded. And so the grading depends on having 3 peers be able to watch and respond to the video. And so we do and send invitation to learners to approach in a different language that they like but they might have to work a little harder to find peers who will grade that work because other students won't understand it.

Table 6 shows the language support strategies used by the participants.

Table 6

Artifacts Reviews: Language Support

Perception	Language support strategies	Interview	Course design
Language plays a role in MOOC learning outcomes, especially for learners who speak a different language than English.	Transcripts, translation, subtitles for the video lectures	All participants in all MOOCs	x
	Visual aids/PowerPoint slides	P1, P2 & 3, P6, P7, P8, P10, P11, P12, P14, P15	x
	Speak clearly and slowly	P8, P9, P14, P15	
	Submission in language of choice (provided with 3 or more peers to review)	P6	

P = Participant

Theme 2: Content. All participants provided supplemental resources for their MOOC learners. These were not required readings; instead, they either provided scaffolding insights and knowledge on the subject that appeared especially helpful for the novice learners, or they allowed further exploration of the topic should the learners have a desire to study the subject in-depth. Otherwise, MOOCs learners were required to watch the video lectures and that was normally sufficient for them to perform course assignments.

In a specific case, for example, in the *Introduction to Human Physiology* course offered by Duke University, there were two strategies that the instructors used to facilitate content comprehension for the international learners. One strategy was to use notes that went along with video lectures. These notes consisted of the same information in the video but were written in paragraphs like a textbook. The other strategy was to give more time for the exam at the end of the course so that the learners who were struggling to read English would have plenty of time to read the questions.

In the case of the *Medical Neuroscience* course, the instructor provided study guides that helped learners better understand the video lectures, especially those who had less neuroscience background (Participant 4). Yet, in the series of programming courses that were intended for undergraduates around the world and working professionals with programming backgrounds, the content materials were designed for intermediate level and yet there was some diversity among the learners in terms of their programming background and skill levels. To accommodate that, the MOOC instructors provided customized video lectures that targeted different groups of learners with different programming skills. They incorporated test quizzes for learners with adequate

programming backgrounds and support videos that were intended to give additional scaffolding to people who came in with less background in programming. Their idea was to structure the videos as core videos that allowed most people who wanted to watch them review the core concepts being taught and that would be required for the programming assignment to be submitted at the end of each module and for the final course assignment. These videos did not provide many examples or hints on the programming assignments but addressed the common conceptions and mistakes. The other sequence of videos was called concept-challenged videos. These videos were especially made for learners who came in with different backgrounds. These videos included challenging questions, and the learners were required to reply to see if they could answer the question. Before the instructors revealed the correct answer, they showed a segment of three university students discussing that question in which some of the common misconceptions surrounding that question were raised. What was important about the discussion, according to the instructors, was that it was spoken by qualified students who were still novices on the subject and spoke with simple language. The question was posed again for the Coursera learners to answer. After that the instructors presented a concluding video to explain what the correct answer was and why. This peer instruction model was adopted from the studied modality of teaching computer science.

Due to the fact that in a number of MOOCs, a majority of learners who signed up for the course came from outside of the U.S, the instructors found it important to foster content comprehension for non-native speakers of English by internationalizing concepts and utilizing examples that were more internationally representative. For example, in the first launch of the *Powerful Tools for Teaching and Learning: Digital Storytelling*

MOOC, 75% of the learners came from outside of the U.S. To customize the content presentation to meet this group of learners' needs and background, the instructor and his team of doctoral students utilized examples that were multicultural.

> If we show a picture of something, rather than showing a picture of the Empire State building which is a famous building in the U.S. we show a picture of the Taj Mahal for example, or the Eiffel Tower thinking that might be more recognizable. We try to do things that are more global and not just focus on the U.S. And we try to break down all the steps of the digital storytelling process so that they started it at the very beginning and we understood that people who signed up for MOOCs English is their second or third language and so we did not assume that they knew as much about everything.

Instructors who taught subjects that reflected deep Western-rooted ways of thinking were even more deeply aware of simplifying the concepts and ideas for the global audience. For example, in the *Property and Liability: An Introduction to Law and Economics* MOOC, the value of the course was based on the big ideas about property and liability and how to think about them, which was very Western and liberal and broad ways of thinking about things. The instructor made an effort to pierce through the concepts and the topic as he was mindful that they were both challenging and unfamiliar to the international learners.

> It's about private property, it's about respecting individuals, and it's about having a distance between you and the state. This his is not stuff for example that university students are going to learn in Beijing. This is the subversive stuff in Asia, subversive stuff in China, subversive stuff in Vietnam, subversive stuff in a lot of places in the world. So various students in Beijing are listening to these lectures, they are doing something about Western liberal thinking that they are not likely to hear anywhere else in China because the governments don't recognize these sorts of rights. So I think of my multicultural students as the way I think of all the other students except to say that I try very hard to not talk about anything in the course that requires you to be in America to understand this. Although there're pictures at baseball games and stuff, I didn't think that would make much

> difference. Anybody in any country who could speak English can figure this stuff out.

Hand-in-hand with the utilization of internationalized content/examples, another strategy the instructors used to enrich and diversify the content was to recruit insights, ideas and stories from their global MOOC learners. This in turn was determined by the subject, in particular, the capacity and degree for which the ideas, concepts or process could be universally interpreted and applied. For example, one of the strategies that the team for the *Powerful Tools for Teaching and Learning: Digital Storytelling* MOOC at the University of Houston used to enrich their course content and embrace diversity was to share exemplary submissions of digital stories by their former MOOC learners with the next generation after attaining their permission to do so. Even though each story was a cultural context on its own and carried its own primary nuance, it could be felt and understood by people of different cultures, especially when it was creatively told with passion from the narrator.

> We give them example stories of different topics but basically we want people to be creative. We want them to pick something that is personally meaningful to them. I think that's what we've learned from teaching digital storytelling is that the best stories come from people who pick a topic that they find personally meaningful so they are motivated to put together a story that comes to the viewers who want the story and they will respond better because they can feel the passion that the story teller had

In the *Rural Health Nursing* MOOC offered by the University of New Mexico, the instructors were specifically looking into the global insights from the students' postings because of the nature of the subject:

> We addressed unconscious bias, which stimulated a lot of discussion. We did an assessment of resources (i.e.) geographic, economic, political and social aspects of healthcare that the students were provided to see how they're related to health. We even read the posts from participants around the world and got into an

exchange with someone who was in India. He was struggling with some of the cultural diversity that involved the castes there. If you're in one particular caste level, you're provided with healthcare that's somehow different from the other caste level from the other areas of the country.

Table 7 shows the content support strategies used by the participants.

Table 7

Artifacts Reviews: Content Support

Perception	Content support strategies	Interview	Course design
Instructors showed dynamic concerns regarding content comprehension for learners, especially those who did not have the required background knowledge for the course or non-native speakers of English. The content support strategies usually targeted these two groups of learners.	Supplemental resources	Most participants	x
	Study guides for video lectures	P4	x
	Addressing/utilizing global insights, ideas, and stories	P12, P13	x
	Notes (book chapter) for video lectures	P2 & 3	
	Customized videos for students of different programming skill levels • Test quizzes for programming background • Scaffolding videos for those of less programming background • Concept-challenged video for those of different background	P6	x
	• Simplify the content presentation • Utilize internationalized content/examples	P12, P14	x

P = Participant

Theme 3: Engagement. Not surprisingly, engagement was one of the biggest categories of concern, and the participants paid a great deal of attention to keep the learners stay with the courses. A common practice among the instructors to engage the learners and build a virtual community was utilizing the built-in feature on Coursera called "general discussion" where learners posted a thread introducing themselves. Two instructors at Duke University went further to customize this kind of discussion thread by either breaking it down into sub-topics according to the lecture topics so that they still could keep track of the different questions, or "meet-and-greet" sessions where the learners could join in and say who they were, where they came from. The power of this cohort support mechanism for weaker learners was somewhat lost on the on-demand format of the MOOCs according to the instructors. Instructors at UCSD, on the other hand, utilized real-world resources and references to draw learners in such as "When I struggle" videos where either the instructors or UCSD students talked about their experience, their inexperience about going through the same materials and what was hard for them, what strategy they used to get past the difficulties and the challenges. They also used "Real World" videos where Google engineers talked about how they used the concepts that were taught in the course, how important they were to working engineers and their real world applications.

A number of other instructors shared their appreciation on the discussion forums created for and by the learners. One participant referred to them as "spontaneous self-crowdsourcing of education:"

> What I could call spontaneous self-crowdsourcing of education… that students will post questions on the forums, and other students would answer them…In many cases, almost all cases, those would be excellent answers…sometimes it's a fairly trivial thing over such and such lecture…and sometimes it will be a person

> who actually has a real expertise in that particular aspect, and was right to answer it better than I would.

Similarly, another participant concurred that the value the discussion forums did not come from the instructor, but from the learners talking to each other. He said "so the students would say 'I didn't understand what he said in this lecture' and four other students would say 'well I don't understand that either' in which the case I would say something."

Thus, the discussion forums became an input gathering place, or a place where learners shared their inspiring stories.

> The other thing we have done is we have an extended discussion forum. Our learners are really active on the discussion forum and really supportive of one another. They share the stories about being stay-at-home parent for 10 years trying to get back into the workforce or moving from one aspect of industry to another and they share tips with one another about how to write their resume or how to prepare for interviews. It's just amazing to see this community form from around the world, people who are in the States, in Europe, in Russia and it's just amazing and they are working together, giving each other advice.

As another form of engagement, learners in one MOOC were required to take charge of their learning by uploading videos of themselves explaining concepts. This was the case of the fourth course in the series of five programming specialization courses offered at UCSD. The course, which focused on technical communication and algorithm problem-solving in the context of an interview and the students' works (video of conceptual explanation), were reviewed. Unique to the context of the interview and job search, there were Coursera learners who 1) were concerned about their level of English in participating in these assignments and 2) were concerned that if they wanted to get a job that way, whether this would be useful to them and feeling uncomfortable because of being out of the workforce for many years and coming back and feeling like they would

be at a disadvantage to people who were just out of school. The fourth course highlighted the diversity of learners and what their diverse challenges were. The instructors did a number of things to address these learners' language needs which were discussed earlier in the language theme.

The instructors facilitated engagement by playing the role of a monitor and a fellow participant in the discussion forum.

> Besides posting the weekly announcement, I would spend maybe 45 minutes to an hour, four or five times during the week in the chat room and most of the time I wouldn't say anything. I just read what people were doing. Occasionally somebody would address something specifically to me that I thought needed to be addressed then I responded to that for everybody.

Yet, realizing human interaction is one of the major components that is not easily scaled in a massive online course, a number of instructors offered multiple channels for instructor-learner and learner-learner interaction.

> I've tried a different varieties of interacting with students…they certainly appreciate me answering questions in forums…I tried Facebook, Google Hangout, virtual world, and nothing has quite really caught on yet…but I think that will be another major issue for the educational industry to sort out how to provide the human interaction experience where knowledge really gets to.

Interestingly, there were certain topics that drew in the types of audience that could trigger some tricky interaction among them and urged the instructor to strategize their instruction in order to solve the problem or at least to distract the audience away from it. For example, in the *Understanding Terrorism and the Terrorist Threat* MOOC offered by the University of Maryland, there was a growing divide among the learners who considered themselves experts on the topic, who already had advanced knowledge on the topic and were taking the course to broaden their network, and the other group who had no background on the topic and wanted to learn something new. Realizing this

division on the discussion board, the instructors broke the audience up into 13 different regional discussion groups and structured the discussion around regional groups who discussed among themselves first and then moved to other groups. A topical exercise was created that required certain people to participate in creating a debate and the others to observe. This was perceived as a vehicle to smooth over cross-cultural issues. To set up this exercise on the discussion board, the instructors had to survey the audience about their personal experience with terrorism and compare and contrast these experiences across regions. The learners were required to share their personal story or opinion about the topic which made them feel they could contribute something to the discussion.

> "Let's tell each other personal stories and what these things kind of personally mean to us. Let's look at whether those things change from region to region" and I think it's really cool, because we've got people talking to each other about terrorism. They are a totally interesting diverse group of audience. We actually had people who affiliated or consider themselves affiliated to radical groups in the same conversations with Nigerian police officers and American agents and Poland refugee workers, etc. So it was really interesting, really active and productive.

Yet, another strategy that the instructor tackled to encourage engagement, especially for students from the Middle East, and women from Japan, Korea, China who were normally less vocal than their Western counterparts, was by bringing up and honoring their voices and insights in the discussion. The instructor believed that honoring their voices was an effective way to make them speak in the class and that was culturally helpful for them who came from the cultures where they were supposed to be silent.

Table 8 shows the engagement facilitation strategies used by the participants.

Table 8

Artifacts Reviews: Engagement Facilitation

Perception	Engagement facilitation strategies	Interviews	Course design
Instructors showed dynamic concerns regarding patterns of engagement by learners of different ethnicity and educational background. Engagement facilitation strategies usually targeted at minorities groups of learners who more or less were not accustomed to American higher education culture.	Peer instruction/user-generated content	P1, P6, P14	x
	Being the monitor and a fellow participant	P14	
	Learners upload videos of themselves explaining concepts	P6	x
	Break audience into regional distribution groups	P7	x
	Speak directly to the camera, make it like a conversation	P15	
	Multiple channels for instructor-student interaction	P1	x
	Extended forum to share personal stories	P6	x
	Meet-and-greet/general discussion	All participants	x
	Make people tell their personal stories	P7	x
	Honor/voice learners' opinions and experience	P15	

P = Participant

Category 2: Pedagogical challenges in addressing multicultural learners' needs in a MOOC. Expectedly, the instructors reported facing a number of pedagogical challenges in their attempts to respond to the culturally diverse MOOC learners. These challenges were strongly connected, but not limited to dealing with different aspects of multicultural learners' needs. The challenges could be due to the nature of the subject, the instructor's personal experience and exposure to a global audience and the context of MOOCs, the instructor's preference and exposure to online interaction, and finally their time commitment to MOOCs.

Table 9 shows the pedagogical challenges in addressing MOOC multicultural learners' needs by the participants.

Table 9

Pedagogical Challenges in Addressing Multicultural Learners' Needs in a MOOC

Category	Description	Participant
Subject-related	• Subject triggers o Controversy o Hostility o Confusion • Incorporate educational purposes into digital storytelling	P7, P13 P12
Peer feedback	Time efficiency, quality	P12
Instructor's expertise and exposure to global audience and online interaction	Challenges to communicate with the learners online, with their needs, and applicable conditions of what was learned	P 11, P14
Time commitment	MOOCs was an additional task	P1, P11

P = Participant

Among the MOOCs that were investigated in this study, there were some whose topics generated controversies and created heated conversations among the learners. That was the case of the *Understanding Terrorism and the Terrorist Threat* MOOC offered by the University of Maryland. The topic drew in the two groups of learners whose levels of prior topical knowledge strikingly different, which described big divergences in educational background and in what people did for a living. According to the instructor, allocating learners into 13 different regional discussion groups helped calm down the frequent heated discussion and/or distract them away from it, but the discussion was sometimes still pretty hostile due to the topic of discussion itself. For example, one of the topics of discussion was North Africa in the real wartime, issues that split the country in half. Some learners started to sound hostile and the instructor had to occasionally intervene by deleting some posts in the discussion that did not sound appropriate and reminding them that they came with a spirit of learning and discovery.

In the same category, in the *Rural Health Nursing* MOOC offered by the University of New Mexico, the invitation of global, rural nurse learners to the discussion allowed a gathering of great insights, but on the other hand, it revealed learners' struggles for which that there were no obvious solutions. According to the instructor, if the learners were struggling with how they could use the nursing knowledge in a general philosophical sense, they would get help having their issue addressed. But as far as discussing to what nurses could do legally in the respective countries, states or regions, which varied wildly from one to the next on a global level, was truly a challenge. The instructor stated it was like asking the question how nursing educators in Albuquerque

could help somebody in North Korea to figure out the range of expertise or skill level that they could expect from a nurse and what they could do for independent practice.

> We had overcome some of those obstacles occasionally and sometimes that required a lot of discussion board, comments back and forth where you get to the point that you felt like the other person understood, you know, one of the hard things about doing an online, particularly with different cultures and languages involved. You are never really sure whether or not the other person got the gist of what you were trying to explain any more than you are sure you got the gist of what the person was trying to say to you.

On another scale, while the *Powerful Tools for Teaching and Learning: Digital Storytelling* MOOC provided worthwhile educational experience for the learners, the instructor and his team in this project-based MOOC struggled with a number of issues. First, as the submissions of digital stories were products of peer review, the team was struggling with the efficiency (whether it was done on time) of the peer assessment process and the subjectivity and quality of the feedback (i.e. whether it met all the goals or not). The other challenge they raised was how to get the learners to think about personally meaningful stories they would have to produce in the educational contexts and how to use a digital story to support and improve the teaching or learning process as an instructor or as a student.

With a more specialized subject where the instructor had planned the course for audience with specific skills, it turned out more than half of the audience were lay people. The instructor received multidirectional comments about the level of difficulty of the course materials.

> It was interesting, they both complained about how hard it is but also complained that there isn't hard enough and they are having some pleasure from the fact that they are taking actual hardcore _____ class and so they have bragging right from that…One interesting thing that caught my attention is a lot of students, and I think most of them, are probably Americans…were having expectations that were

> not warranted by the fact…they're sort of feeling extremely entitled…demanding better service, and I had to remind people repeatedly that they are all guest, they are having a free gift, and they don't have to take it…it is what it is…they are not paying customers… and sometimes people take that too hard, but I was surprised…people just expect free goodies, free service, and complained when the entertainment isn't up to their satisfaction.

Similarly, the *Introduction to Cataract Surgery* MOOC offered by the University of Michigan was intended for residents in an ophthalmology residency program, but more than 50% of the audience was lay people. The instructor confessed that it was very difficult to target the level of difficulty of the materials. Some learners wanted more in-depth lectures on a particular topic, and some others expressed that the materials were very difficult for them. The instructor was frustrated with the fact that what was offered was not what some learners wanted and at the same time realized her limitations to not be able to respond to the massive group of learners in time despite her willingness to help. The other challenge the instructor felt was some disconnection with the MOOC learners as opposed to those in a campus-based course.

> I feel that gratification as an instructor I would like to know "Did they learn?" "Did it help them?" "What are they going to do with it?" "How are they incorporating this into their education?," and you don't get that response necessarily.

While being content that a lot of learners who found the course special and wrote the comments were not necessarily ophthalmologists or residents, the instructor was confused as the target audience wasn't necessarily very vocal on the discussion forum. On another level, the instructor did not think she had enough experience doing cataract surgery all around the world and felt that she should teach people how to do it in a very similar situation as she was trained. Another concern the instructor had related to the

ability to perform cataract surgery in a particular place or situation based on available equipment.

> We did try to show a couple of different ways to do cataract surgery, particularly if you don't have the finances to have the machine…but that was just one lecture. That's another problem that I faced…in other countries I don't know what equipment they have, and people didn't necessarily say that…so, I don't know if that was an issue, but in creating and delivering the course that was something I had to think about, but a lot of the principles might be the same, and they might be able to apply it even if it's not exactly the same situation for them.

On the note of connecting with the learners online, despite the appreciation at the opportunity to distribute the ideas out to the world through MOOCs, the instructor of the *Property and Liability: An Introduction to Law and Economics MOOC* expressed his uneasy struggle to feel more engaged with the learners due to the fact that he could not see them and attach names or faces to individual learners. The only place he could see his learners was LinkedIn when they sent him invitation requests.

On the final category of time commitment, a number of instructors who were interviewed expressed their struggle with the constrained time commitment they could make for MOOCs while having the desire to modify and improve the MOOCs. For most of the instructors who were performing a full load of responsibilities at their institutions, MOOCs were a side task that was done either out of intellectual curiosity or with a philanthropic drive to serve the community, among other impetuses. They believed that the institutions should come up with a reasonable and organized mechanism to make MOOCs an independent item on the faculty's agenda, especially when learners were required to pay for the course, the expectations from the learners would be higher.

Chapter Summary

Chapter 4 presented a review of the research design followed by three major parts of data results of the study. The first part detailed the description of the participants, including their professional profiles, and their roles in the design and development of the MOOCs. The second part described the investigated MOOCs and aspects of course design that addressed multicultural learners' needs. The third part reported the data results in three sessions. The first session described the diverse audience that the MOOCs served. Most of the participants had mixed expectations of global audience for their MOOCs and yet in reality were surprised at the degree of diversity among the audience. The second session explained the instructors' and instructional designers' perceptions of multicultural learners' needs and the instructional strategies they used to address such needs, which in most cases went hand in hand and were grouped into three common themes (i.e. language, content, and engagement). The last session reported the pedagogical challenges the instructors and instructional designers faced in dealing with diversity in their MOOCs. Chapter 5 will discuss the findings of the study and the conclusions.

Chapter V

Conclusions and Discussion

Introduction

The purpose of this study was to investigate instructors' and instructional designers' perceptions of multicultural learners' needs in Massive Open Online Courses (MOOCs). It also examined how these perceptions shaped the choices of instructional strategies used by these instructors and instructional designers to design and develop the MOOCs and the pedagogical challenges they faced when dealing with diverse learner populations.

Chapter 5 provides a summary of the findings, a discussion of the findings in relation to the literature review, the limitations of the study, and implications for practice. Chapter 5 concludes with recommendations for further research.

Summary of the Findings

This qualitative research study recruited instructors and instructional designers who were involved in designing and teaching a MOOC to share their perceptions about the needs of multicultural learners in their MOOCs, the instructional strategies they used to respond to these needs, and pedagogical challenges they faced. The research questions guiding the study were:

- What were MOOC instructors' and designers' perceptions of multicultural learners' needs when designing MOOCs?
- What instructional strategies were used to address multicultural learners' needs in a MOOC learning environment?

- What were the pedagogical challenges that MOOC instructors and designers faced in determining and addressing multicultural learners' needs in a MOOC?

Fifteen participants accepted the interview invitation and completed a scheduled interview with the researcher. Findings were grouped into three parts: 1) aspects of course design that addressed multicultural learners' needs of the investigated MOOCs, 2) instructors' and instructional designers' perceptions of diversity and multicultural learners' needs as well as instructional strategies they used to respond to these needs, and 3) pedagogical challenges these instructors and instructional designers faced during the design and development their MOOCs. Collected data from the interviews are reported both by individual cases and in a consolidated fashion (Stake, 2006) and are compared with evidence from course designs on the attempts to address multicultural learners' needs.

Aspects of MOOC design that responded to diverse learners' needs included the built-in course components that offered options/choices of language of assignment submissions and content materials categorized by levels of difficulties for learners of different ethnic, language backgrounds, and educational levels etc. During the delivery phase, indications of instructional strategies that addressed multicultural learners' needs were language support, content support, and multiple forms of online interactions (i.e. instructor-students, students-students) to encourage student engagement. The instructors' and instructional designers' perceptions of diversity and multicultural learners' needs and the instructional strategies that they used to respond to the needs were organized into three themes: language, content and engagement. Overall, most of the instructors concurred that language played a role in MOOC learning outcomes, especially for

learners who spoke English as a second or foreign language. In regards to the course content, the participants showed various concerns regarding content comprehension for learners, especially for two groups of learners: those who did not have the required background knowledge for the course and non-native speakers of English. The content support strategies usually targeted these two groups of learners. The instructors and designers also showed concerns about patterns of engagement by learners of different ethnicities and educational backgrounds. Engagement facilitation strategies were usually targeted at minority groups of learners who were not accustomed to the culture of American higher education. Finally, these instructors and instructional designers shared the pedagogical challenges and concerns they had regarding MOOC design in general and addressing for diversity needs specifically.

Discussion of the Findings Related to the Literature Review

Roles of the instructors and instructional designers in the design and development of MOOCs. The participants in this study played multiple roles in the design and development of MOOCs. Among the roles were teachers, administrators, leaders of the collaboration team either with other faculty members or with doctoral students, coordinator and course designer, or as course liaison. Regarding the connection with the audience, most of these instructors fit the analogy of a rock star whose performance is viewed by thousands of audience members around the world because of the massive volume and diversity among learners in their MOOCs. Most of the participants in this study who were the MOOC instructors shared a number of pedagogical concerns in relation to their roles in a MOOC such as: 1) the inability to grade or give personal feedback on the learners' assignments due to the enormous

volume of submissions, 2) the feeling of lack of control over the overwhelming amount of input provided by the learners on the discussion forum, and 3) a lack of personalized interaction with the learners. These concerns were aligned with findings by Haavind & Sistek-Chandler's (2015) work on the instructors' perceptions of their roles teaching a variety of MOOC subjects: the instructor felt a lack of control due to the overwhelming amount of input from the learners and mild disappointment from not being able to assess all the submitted work.

Triggered by the massive open online environment, learners in the investigated MOOCs possessed different characteristics and demonstrated different learning patterns from those in campus-based courses. MOOC learners signed up for the courses voluntarily and were proactive, self-motivated and self-directed towards making progress through the course or completing the course. The instructors who participated in the study seemed to be well aware and adaptive of the shift in roles among their MOOC learners by adding to their traditional roles as a content expert, the roles of engagement facilitator, discussion monitor, course designer and a culturally sensitive and responsive fellow participant.

Aspects of course design that address multicultural learners' needs.

Instructional design for MOOCs required, but were not limited to, content accommodations and cultural adaptation for the massive number of learners, and learner-centric communication methods for interaction (Stanley, 2015). Content accommodations to better meet the needs of the MOOC global learners were demonstrated by: adding supplemental learning resources in different formats; creating study guides for video lectures; utilizing global insights, ideas, and stories; creating notes for video lectures; and

customizing the content videos for learners of different academic backgrounds and skill levels. Cultural adaptation in the course content design was reflected as the simplification of the content presentation and the utilization of internationalized content/examples. The design choices that brought about learner-center methods of communication (even though such endeavors were reflected on a more individual level and their effects were still anecdotally reported) were reflected in the multiple channels of interaction that most of these instructors decided to use to enhance learner-learner and instructor-learner interaction, as well as to go further and offer live communication opportunities (i.e. Skype, Google Hangout) between instructors and the learners.

Most of the investigated MOOCs had the built-in features that demonstrated the support for the learning needs of massive and culturally diverse audiences. The built-in support features were grouped into two major categories: language support and course format support. The built-in language support was indicated by the inclusion of transcripts, subtitles, and translation of the course content videos into different languages. Course format support included a number of techniques the instructors used to either enhance the learners' comprehension of content (such as the insertion of PowerPoint slides or other forms of visual aids on top of the content videos), or to reinforce learners' engagement (such as creating multiple discussion venues; creating meet-and-greet discussion threads on the discussion forum; encouraging learners to create study groups based on their language background or geographical location; or employing mentors or teaching assistants to monitor the discussion forums, to help translate the course content videos, or to help with assessment). The design efforts in the investigated courses by the

instructors and instructional designers reflected to a great extent their concerns for diversity in the MOOCs and matched what they shared in the interview.

Most of the participants demonstrated their quality teaching practices in their MOOCs, reflected in the design phase as characterized by Bali (2014), Tomkin and Charlevoix (2014), and Zhang (2013) such as:

Presentation skills: Video presentations in most of the MOOCs were high quality, carried personal messages to the learners, and conveyed a warm, friendly tone, as well as the humor and personality of the instructors and their passion for the subject.

High quality content: The content in the investigated MOOCs was high quality and relevant with many additional resources available to help the learners.

Managerial skills: Most instructors employed Teaching Assistants who were their doctoral students or their former MOOC students to help with the content video translation, to monitor the discussion forum, and/or assist with assessment.

Personalization: Learners in most of the investigated MOOCs were encouraged to build their own study groups and were given the options to build their own groups by background language, location proximity and so forth on Coursera. These instructors also created multiple communication channels both synchronous and asynchronous, such as Facebook pages, virtual office hours besides the discussion forums on Coursera to facilitate learner-learner and instructor-learner interaction. Instructors also addressed learners by names on the weekly email announcements to individual learners.

Foster learner-centered interaction: A number of participants in this study felt rewarded to be offering the MOOCs because they were in the subject areas of their expertise and the conversations the learners brought to the discussion forums pertained to

their professional and personal interests. Some others felt that building a professional and diverse community on the subject was the main goal of teaching a MOOC, and yet others took pride in sharing their passion on the subject to the world.

Research Questions 1 and 2: Instructors and instructional designers' perceptions of multicultural learners' needs in a MOOC and instructional strategies used to address such needs.

Even though the participants who were the MOOC instructors and designers had different approaches to designing and delivering their MOOCs, there were two common themes: 1) they showed deep pedagogical concerns about the quality of the instruction, and 2) they shared different perceptions towards diversity. As mentioned earlier in Chapter 4, most of the participants in this study began the MOOC design and development process with a mixed mindset - expecting a global audience and yet being surprised at the degree of diversity among the learners. One reason that some participants were surprised was that despite the awareness of global audience attendance, they designed the MOOCs with a specific audience in mind as a result of their experiences teaching the campus-based courses. Consequently, they suddenly felt less prepared during the course launch because the audience turned out to be much more diverse than they expected. Some instructors were concerned about whether their personal experience and expertise was applicable to the broad group of learners and became concerned that this would affect the learning outcomes of the learners, especially those outside of the U.S. as they were professionally trained to work with the U.S. student population.

Perceptions towards diversity by the participants were various and could be categorized into three groups: 1) cultural differences among learners' appreciation and

satisfaction towards MOOCs, 2) the merits of MOOCs for diverse audiences, and 3) the advantages of MOOCs. Some instructors noticed a striking cultural difference in the attitude, appreciation and satisfaction towards the MOOCs by learners of different cultures. Specifically, learners from the so-called "third world countries" seemed to appreciate the opportunities to take quality courses in English from well-known American universities and higher educational institutions and became highly driven by such pride. On the other hand, Western learners in general, and Americans specifically, demonstrated more critical attitudes, complained the courses were too hard or not hard enough, demanded better service, and complained when the service was not up to their satisfaction. Thus, most of the participants believed that one of the biggest merits of MOOCs was to reach out to the diverse groups of audiences, referred to as minorities, who came from different language and educational backgrounds and were not adequately exposed to the American standard of education. This philanthropic drive, together with other goals, motivated the instructors to improve the course quality and thus spoke to the heart of education: the desire to better serve the public, the poor, and the underserved.

As mentioned earlier, perceptions towards multicultural learners' needs of the instructors and instructional designers were paired with the instructional strategies they used to address such needs. The three themes that emerged were: language, content, and engagement.

Language. Most of the participants in the study expressed overt concerns for language regarding the learning performances of the non-native speakers of English. Such concerns either came out of their sympathy for the learners resulting from their personal exposure to foreign languages or their caring attitude for these naturally

disadvantaged learners who spoke English as a second language and faced the language barriers in their learning. They believed that language played a big role in determining the learning outcomes of this group of learners, they strived for different methods and strategies to support them in overcoming the language barriers, and cheered for the learners' successes and achievements. Commonly found language strategies used to support MOOC learners in general, and non-native speakers of English in particular, were the use of transcripts, translation, subtitles and visual aids and/or PowerPoint slides in addition to the video lectures. Also the instructors attempted to speak clearly and slowly in the audio and narration portions of the videos, and some instructors even allowed the learners to submit their work in the language of their choice (provided they could find three or more peers to review the work in that language).

The employment of the above language support strategies reflected the participants' understanding the impact of learners' culture and language to their learning behaviors and their action resulting from such understanding. On the other hand, the different ways of thinking and acting by learners of diverse cultures and languages presented challenges to practices and approaches applied in online instruction across cultures (Ke, Chavez & Herrera, 2013). This was evidenced in the *Understanding Terrorism and the Terrorist Threat* MOOC where the instructor witnessed heated conversations triggered by controversial topics and authored by learners from different regions of the world. Another case of how different languages and cultures impacted the way the learners was the case of the *Rural Health Nursing* MOOC. Two learners who were engaged in a discussion about nursing came from different parts of India but did not know each other. They were engaged in the conversation in a way that the instructor

identified as “getting to a heated discussion.” However, this was an acceptable behavior in their culture; there was still an element of respectful tone in the postings. The instructor became concerned that the learners were about to get into some hostile conversation if they were not careful and wanted to provide some intervention. Yet, the conversation managed to resolve itself with minimal comments and was redirected into something that became respectful of each other.

Content. Most of the participants who were the instructors showed multiple concerns regarding the comprehension of content by learners, especially those who did not have the required background knowledge for the course or were non-native speakers of English. The content support strategies included: 1) supplementing the video lectures provided to the learners with additional resources in different formats, 2) providing study guides for the content in the video lectures, 3) gathering/honoring global insights, ideas, and stories from the learners, 4) providing notes (that consisted of the same information as in the content video but written in paragraphs like a textbook) for video lectures, 4) customizing content videos for different knowledge levels for learners of different academic backgrounds and skill levels, and 5) simplifying the content presentation and utilizing international content and examples to make the content relevant for an international audience.

As indicated in the review of literature, the massive, open, and online nature of MOOCs both stimulates and challenges the instructors and course designers. The types of learning materials and activities presented in MOOCs were determined by the available technological capacities, the instructor’s exposure to technology, and the amount of technology support they received, among others. Course designers also faced the

challenge of balancing between the learning objectives, appropriate sequence and pace, the quality of the learning materials, and satisfactory methods of assessment and interaction (Klobas, Mackintosh, & Murphy, 2014). Thus, the participants possessed different levels of technical skills, had different levels of exposure to online teaching and learning, and received varying amounts of technology support from their institution. Common indications of addressing diverse learners' needs in terms of content were that the courses demonstrated clear, measurable and achievable learning objectives. Learners were provided with different sets of roadmaps to accomplish the learning goals defined for them or by them. The learners were also able to choose what recognition they would receive for their effort based on the investment they were willing to provide. For example, Coursera provides certificates of accomplishment for the learners who passed the courses, or allows learners to take the courses at their own pace, or allows learners free enrollment to audit the course, to view or to download the content materials.

Findings in this study indicated that the participants went beyond their teaching and designing duties to pay close attention to the learners' needs by providing customized and personalized learning supports, such as study guides or notes for the content videos, and by using instructional strategies that were inclusive, such as diversifying content videos for learners of different skill levels. In addition, the participants attempted to internationalize the content by using examples or content pieces that were applicable to global audience. The very real experience of dealing with this massive and diverse audience challenged the instructors and course designers and allowed them to experience the immediate effects of their involvement and pedagogical innovation in the course. The

learners' feedback, which was faster-paced, non-traditional, spontaneous and more diverse than that in a conventional course, contributed significantly to this experience.

Engagement. A study by Phan et al. (2016) indicated that learners who demonstrated active engagement during a MOOC tend to outperform the ones who did not prioritize a similar trait. Given that, the instructors interviewed in this study showed various concerns about different patterns of engagement in the courses by learners of different ethnicity, language and educational background. These global learners brought with them aspects of their native language and cultural identities that were shaped by their educational background when immersing themselves into the mainstream American classroom culture to create a virtual multicultural classroom. This mosaic virtual multicultural classroom varied by the content subject and the groups of learners who participated in the course, as well as the virtual environment created for them.

Engagement facilitation strategies applied by the instructors in this study usually targeted supporting groups of learners who were not familiar with the American higher education system. The strategies applied by these participants varied, and reflected their observation and acknowledgement of the learners' needs to be engaged in the course. Some instructors took advantage of the built-in features such as the discussion forums or the study groups on the Coursera to accelerate online discussion among the learners, others participated in the discussion as fellow learners, yet others went further to offer a variety of communication avenues for the learners such as Facebook pages, virtual office hours, Google Hangout. Other instructors acquired a high degree of proactive participation from the learners by breaking them into regional discussion groups before inviting them into the massive group, having them upload videos of themselves

explaining concepts, or asking them share their personal stories either through a self-introduction thread (or sometimes called "meet-and-greet" sessions in some MOOCs). The personal storytelling could also be extended to be related to, or part of the course assignments they were doing. Again, due to the amount of work experience with and exposure to an international audience, some instructors applied their insights and knowledge about the cultural effects on communication patterns of international learners to bring out the best in them, such as in the case of honoring/broadcasting opinions of learners who had great ideas but were usually less vocal than their Western classmates.

The implementation of engagement facilitation strategies was dependent on the subjects being taught, the instructors' and course designers' experiences and exposure to a global audience, and their time commitment. Learners in the investigated MOOCs in this study were granted the opportunities to extensively communicate with one another from different parts of the world across different skill levels and regardless of their language and educational background due to the application of a wide variety of engagement facilitation strategies by the participants who were the instructors.

Research Question 3: Pedagogical challenges in addressing multicultural learners' needs in a MOOC.

In a study by Rensing, Freitas, Ley and Muñoz-Merino (2014), the authors reported that MOOCs were an exciting online learning environment that provided numerous advantages to the learners, among them are the wealth of resources, the dynamic, contextualized and authentic interactions on the subject or the cultural exchanges and personal experiences among the learners. Driven by a sense of personal pride to make an impact, the joy of sharing the passion on the subject to the world, and a

philanthropic goal to help the less advantaged with education, these participants were excited to participate in the design and development of their MOOCs, applied the best teaching practices that they used in their institutions, explored new teaching styles and techniques, and were eager to engage and gain from the interaction with the learners.

Despite these positive goals, pedagogical implementation in a massive open online learning environment was challenging. A common challenge faced by most of the instructors and course designers which aligned with the findings of Ferguson and Sharples (2014), was that they were not able to provide prompt feedback to the learners but had to heavily rely on the teaching assistants to monitor the discussion forums and to respond to questions from the learners. There were also problems with a high volume of issues in the course that had to be managed by a handful of teaching assistants. Another typical challenge raised by most of the instructors was their struggle with the time commitment for the MOOCs. Most of these instructors and course designers had to teach regular courses on campus besides conducting research and performing other vital responsibilities in their institutions. They expressed the dilemma they had between the desire to improving the MOOCs and reaching broader audiences versus the limited time they had for MOOCs.

New findings in this study were the pedagogical challenges of the instructors that were triggered by subjects that were culturally sensitive. In some cases, the discussion forums generated some controversial topics and/or a sense of hostility among the learners as described in Chapter 4. Even though the instructors used strategies to organize the discussion in such a way as to minimize hostile feelings, while inviting everyone to join the discussion and celebrating the learning and exploration throughout the course, it was

the subject itself that generated and drew learners into such controversies. On a positive note about pedagogical challenges, the instructors in the course that provided educational tools for teachers and educators, faced a different type of challenge about how to gear the learners toward the educational focus of an online teaching tool, as in how to use digital stories to support and improve teaching and learning quality as a teacher and as a learner.

Yet, another type of challenge that the participants who were the instructors of the niche subjects such as *Galaxies and Cosmology* or *Introduction to Cataract Surgery* faced was that the courses were designed for learners with certain background knowledge of the subject, but in reality the audience was more diverse and included people who did not meet the requirements of having background of the target audience. As a consequence of dealing with a broader diverse group of learners that they were not fully prepared for, the instructors received different kinds of feedback from the learners about the level of difficulty of the course, the attitude towards what was available and the demand for better service including the complaints when the service was not up to their satisfaction. Another challenge for the participants who taught the MOOCs of niche subjects that required prerequisite knowledge was that they sometimes felt they did not have sufficient expertise to teach the subject to a global audience as they were trained to work with specific audiences within the U.S. There was also an issue with students not having the correct equipment to perform the tasks in other countries.

Finally, some instructors struggled with connecting with the learners in the online learning environment, especially one at the massive scale of MOOCs. The instructors had the same strong desire to know whether and how much the students learned, as well as how they applied what they learned to practice in the virtual classroom as much as they

did on a campus-based course. While it was possible to capture a whole picture of students' learning outcomes in a campus-based course, this was hardly a possible task in a MOOC learning environment due to the come-and-go of the MOOC learners and the lack of obligation for them to perform. On top of that, the instructor also did not feel they knew their learners at an individual level such as their names, backgrounds, strength and/or weakness. As a consequence, these instructors felt disconnected (or less connected) with the learners in the online environment as opposed to their campus-based students.

Limitations

A limitation of this study is the generalizability of the findings. Even though the participants represented diverse disciplines and both public and private higher education institutions in the United States, it does not reveal the complete story of multicultural learners' needs in MOOCs, how they are perceived and responded to by instructors, or what pedagogical challenges became evident along the way. In addition, only online modes of communication were used for data collection in this study. Other methods such as in-person observation and discussion could reveal additional findings.

Significance of the Study

As MOOCs become a more widespread phenomenon in higher education and formal credits and recognition evolve, responses to questions about the instructional quality of the MOOCs have become more urgent and critical. Despite the many goals of developing MOOCs by institutions and individuals reported by Hollands and Tirthali (2014), the original goal of MOOCs was to bring quality education to global learners. The researcher believes that one of the critical issues of online learning on a large scale

revolves around the umbrella question of how to deal with the global audience of learners. Building and delivering massive open online courses around the concept of global diversity and responding to the learning needs of multicultural learners with adequate acknowledgement of the learners' diverse backgrounds and their manifestation into learning patterns and behaviors shed the light on the problem to some extent. This study contributes to the mission of educating the global audience by providing these insights: 1) instructors' and course designers' perceptions about multicultural learners' needs and how these perceptions and identification of the learners' needs guided them in designing and delivering the course, and 2) instructional strategies they applied to respond to such needs, and 3) pedagogical challenges they had while pursuing these goals.

Major contributions of this study include sharing the internal voices of the instructors who designed, developed and taught the MOOCs. Various insights into global learners' backgrounds by the MOOC instructors and designers that shaped their responses to learners' learning behaviors and needs contributed to the knowledge base of MOOC instruction. Instructional strategies that these instructors used to deal with multicultural learners as well as to engage them and accelerate their performances in the MOOCs across disciplines can be valuable sources of reference for the next generations of MOOC instructors and designers. In the meantime, the pedagogical challenges reported in this study can serve as a reference for the instructors and course designers when starting their MOOC design and delivery journey.

Implications for Practice

If educators are warned against "one size fits all" in their professional practice, perhaps the greatest implication for practice from this study is that MOOCs will probably never be about "one size fits all." All of the narratives, anecdotes, and lessons learned from MOOCs can serve as a source of reference at best. A successful MOOC model cannot be simply transplanted or replicated because aspects of the learners' diversity (what the researcher would refer as "micro level" in which evidence of diversity is shown within an inner group of learners who are normally bounded within a territory and share the same language, culture and educational background; and "macro level" among learners who share none of the above) are magnified and become more critical variables in a MOOC learning environment. The instructors and course designers have to "pick and choose" their instructional content by "trying out" different instructional strategies and may have to accept the possibility of failure in the design and delivery of MOOCs. Each MOOC is a unique package from the way it is designed, the philosophy behind it, and most importantly, the audience who participates. This is the nature and the beauty of this type of online learning environment: while it gives the instructors and course designers exciting experiences in the freedom of design, it also requires them to provide flexibility, choices and options for the learners. This could possibly mean a tremendous time commitment on designing a MOOC and challenges in considering all aspects of the learners' diversity.

Findings in this study should not serve as a single reference for MOOC design and development. Instructors and course designers of MOOCs should also consider

guidelines on the Coursera Partner Help Center and other sources of references and publications from institutions who pioneered MOOC design and delivery.

Recommendation for Future Research

There are many possibilities to extend the findings of this study in order to "tell a more complete story" of how MOOC instructors and course designers perceive and respond to multicultural learners' needs. It is recommended that replication of this study be conducted on another MOOC platform besides Coursera, such as edX, Future Learn, Stanford Online, or Udacity, to name a few. Extending this study to another MOOC platform may help identify pedagogical strengths and weakness in different MOOC providers and their potential impact on learning outcomes.

In regards to methodology, it is recommended that the data collection be extended with the inclusion of face-to-face interview components and classroom observations with instructors and instructional designers who develop and launch MOOCs in addition to the online and telephone interview method that was employed in this study. Classroom observations on campus would provide great quality data sources for the study. These resources would in turn set the background and provide guidance for further exploration on pedagogical challenges and instructional strategies at other institutions.

Another possibility to extend this study is to investigate the pedagogical transformation between MOOCs and conventional campus-based courses offered by the same instructors. Insights into pedagogical transformation between MOOCs and conventional courses made by the instructors who teach MOOCs and campus-based courses could paint a larger picture of pedagogical approaches used in both environments.

Conclusion

The purpose of this study was to describe the perceptions of MOOC instructors and designers regarding multicultural learners' needs in their courses and how those perceptions are manifested in the design phase of the MOOC. The study also examined the perceptions of these instructors and designers about the pedagogical challenges then faced when designing the MOOCs for learners across the globe. In addition, the study explored different instructional strategies that MOOC instructors and designers used to respond to the learners' needs in the MOOC learning environment. With this purpose in mind, the research questions of the study were:

- What were MOOC instructors' and designers' perceptions of multicultural learners' needs when designing MOOCs?
- What instructional strategies were used to address multicultural learners' needs in a MOOC learning environment?
- What were the pedagogical challenges that MOOC instructors and designers faced in determining and addressing multicultural learners' needs in a MOOC?

The review of MOOC literature revealed the absence of examination of aspects of MOOC learners' diverse language, cultural and educational backgrounds, how these diversities were translated into their learning behaviors and needs, how the instructors responded to the needs and what challenges they faced when doing so.

Findings of the study were organized into the following categories: 1) participants' roles in the design and development of MOOCs, 2) aspects of course design that address multicultural learners' needs, 3) expectations and reality of MOOC audiences, 4) instructors and instructional designers' perceptions of multicultural

learners' needs in a MOOC and instructional strategies used to address such needs, and 5) pedagogical challenges in addressing multicultural learners' needs in a MOOC.

The study revealed diverse perceptions towards MOOC multicultural learners' needs and multiple instructional strategies used by the instructors and course designers in responding to the needs. The participants also shared a number of common challenges that are associated with dealing with a massive global audience or peculiar to a particular MOOC subject. It is suggested that the findings of the study be regarded as a source of reference for future generation of MOOC instructors and course designers. Despite the limited generalizability and limitations in data collection methods, it is hoped that this study will contribute to the field of MOOC instruction with insights and resources of global MOOC learners and their behaviors, instructional strategies used by the instructors when working with multicultural learners, and challenges they faced when doing so.

References

Adeoye, B., & Wentling, R. M. (2007). The relationship between national culture and the usability of an e-learning system. *International Journal on E-learning*, *6*(1), 119-146. http://dx.doi.org/10.1080/1367886042000338245

Anakwe, U., Kessler, E., & Christensen, E. (1999). Distance learning and cultural diversity: Potential users' perspective. *International Journal of Organizational analysis*, *7*(3), 224-243. http://dx.doi.org/10.1108/eb028901

Andersen, R., & Ponti, M. (2014). Participatory pedagogy in an open educational course: Challenges and opportunities. *Distance Education*, *35*(2), 234-249. http://dx.doi.org/10.1080/01587919.2014.917703

Anderson, B., & Simpson, M. (2007). Ethical issues in online education. *Open Learning*, *22*(2), 129-138. http://dx.doi.org/10.1080/02680510701306673

Au, K. H., & Kawakami, A. J. (1994). Cultural congruence in instruction. In E.R. Hollins, J.E. King, & W.C. Hayman (Eds.), *Teaching diverse populations: Formulating a knowledge base* (pp. 5-23). Albany: State University of New York Press.

Audsley, S., Fernando, K., Maxson, B., Robinson, B., & Varney, K. (2013). An examination of Coursera as an information environment: Does Coursera fulfill its mission to provide open education to all? *The Serials Librarian*, *65*(2), 136-166. http://dx.doi.org/10.1080/0361526x.2013.781979

Bali, M. (2014). MOOC pedagogy: Gleaning good practice from existing MOOCs. *MERLOT Journal of Online Learning and Teaching*, *10*(1), 44-56. Retrieved from http://jolt.merlot.org/vol10no1/bali_0314.pdf

Bayne, S., & Ross, J. (2014). MOOC pedagogy. In P. Kim (Ed.), *Massive open online courses: The MOOC revolution* (pp. 23-45). New York: Routledge.

Billington, P., & Fronmueller, M. (2013). MOOCs and the future of higher education. *Journal of Higher Education Theory and Practice*, *13*(3/4), 36-43.

Bligh, J. (2002). The first year of doctoring: Still a survival exercise. *Medical Education*, *36*, 2–3. http://dx.doi.org/10.1046/j.1365-2923.2002.01129.x

Bonk, C. J., Lee. M.M., Reeves, T.C., & Reynolds, T. H. (in press). The emergence and design of massive open online courses (MOOCs). In R.A. Reiser, & J.V. Demsey (Ed.), *Trends and issues in instructional design and technology* (4th Ed.). Boston, MA: Pearson.

Boud, D. (1995). *Enhancing learning through self-assessment*. New York: Routledge.

Bremer, C. (2012). New format for online courses: The open course future of learning. *Proceedings of eLearning Baltics eLBa 2012*, 63-90. Retrieved from http://www.bremer.cx/vortrag67/Artikel_elba2012_opco_bremer.pdf

Breslow, L., Pritchard, D., DeBoer, J., Stump, G., Ho, A., & Seaton, D. (2013). Studying learning in the worldwide classroom: Research into edX's first MOOC. *Research & Practice in Assessment*, *8*(1), 13-25. Retrieved from http://www.rpajournal.com/studying-learning-in-the-worldwide-classroom-research-into-edxs-first-mooc/

Bruff, D., Fisher, D., McEwen, K., & Smith, B. (2013). Wrapping a MOOC: Student perceptions of an experiment in blended learning. *MERLOT Journal of Online Learning and Teaching*, *9*(2), 187-199. Retrieved from http://jolt.merlot.org/vol9no2/bruff_0613.htm

Buerck, J. P., Malmstrom, T., & Peppers, E. (2003). Learning environments and learning styles: Non-traditional student enrollment and success in an Internet-based versus a lecture-based computer science course. *Learning Environments Research, 6*(2), 137-155. http://dx.doi.org/10.1023/A:1024939002433

Capuano, N., Salerno, S., Mangione, G. R., & Pierri, A. (2014). Semantically connected learning resources fostering intuitive guided learning. *International Journal of Continuing Engineering Education and Life Long Learning 6, 24*(2), 122-140. http://dx.doi.org/10.1504/ijceell.2014.060153

Cercone, K. (2008). Characteristics of adult learners with implications for online learning design. *AACE Journal, 16*(2), 137-159.

Chen, R., Bennett, S., & Maton, K. (2008). The adaptation of Chinese international students to online flexible learning: Two case studies. *Distance Education, 29*(3), 307-323. http://dx.doi.org/10.1080/01587910802395821

Cheon, J., & Grant, M. M. (2012). The effects of metaphorical interface on germane cognitive load in web-based instruction. *Educational Technology Research and Development, 60*(3), 399-420. http://dx.doi.org/10.1007/s11423-012-9236-7

Chyung, S. Y. (2007). Age and gender differences in online behavior, self-efficacy and academic performance. *Quarterly Review of Distance Education, 8*(3), 213-222.

Clow, D. (2013, April). MOOCs and the funnel of participation. In D. Suthers, K. Verbert, E. Duval, & X. Ochoa (Eds.), *Proceedings of the Third International Conference on Learning Analytics and Knowledge* (pp.185-189). New York: Association for Computing Machinery. Retrieved from http://dx.doi.org/10.1145/2460296.2460332

Collis, B. (1999). Designing for differences: Cultural issues in the design of www-based course-support sites. *British Journal of Educational Technology*, *30*(3), 201-215. http://dx.doi.org/10.1111/1467-8535.00110

Cormier, D., & Siemens, G. (2010). The open course: Through the open door-open courses as research, learning, and engagement. *Educause Review*, *45*(4), 30-32. Retrieved from http://er.educause.edu/articles/2010/8/through-the-open-door-open-courses-as-research-learning-and-engagement

Croxton, R. A. (2014). The role of interactivity in student satisfaction and persistence in online learning. MERLOT *Journal of Online Learning and Teaching*, *10*(2), 314-325. Retrieved from http://jolt.merlot.org/vol10no2/croxton_0614.pdf

Cuseo, J. (2004). The empirical case against large class size: Adverse effects on the teaching, learning, and retention of first-year students. *The Journal of Faculty Development*, *21*(1), 5–21.

Dahlin, B., & Watkins, D. (2000). The role of repetition in the processes of memorising and understanding: A comparison of the views of German and Chinese secondary school students in Hong Kong. *British Journal of Educational Psychology*, *70*(1), 65–84. http://dx.doi.org/10.1348/000709900157976

Davis, J. (2006). Designing an online course for nontraditional students: Revisiting the essentials. *International Journal of Learning*, *12*(10), 121-127.

DeBoer, J., Ho, A. D., Stump, G. S., & Breslow, L. (2014). Changing "course": Reconceptualizing educational variables for massive open online courses. *Educational Researcher*, *43*(2), 74-84. http://dx.doi.org/10.3102/0013189x14523038

DeBoer, J., Stump, G. S., Seaton, D., & Breslow, L. (2013, June). *Diversity in MOOC students' backgrounds and behaviors in relationship to performance in 6.002 x.* Paper presented at The Sixth Conference of MIT's Learning International Networks Consortium (LINC), Cambridge, Massachusetts. Retrieved from http://linc.mit.edu/linc2013/presentations/Session2DeBoer.pdf

Dillon, P., Wang, R., & Tearle, P. (2007). Cultural disconnection in virtual education. *Pedagogy, Culture & Society, 15*(2), 153-174. http://dx.doi.org/10.1080/14681360701403565

Ebben, M., & Murphy, J. S. (2014). Unpacking MOOC scholarly discourse: A review of nascent MOOC scholarship. *Learning, Media and Technology, 39*(3), 328-345. http://dx.doi.org/10.1080/17439884.2013.878352

Engle, D., Mankoff, C., & Carbrey, J. (2015). Coursera's introductory human physiology course: Factors that characterize successful completion of a MOOC. *The International Review of Research in Open and Distributed Learning*, *16*(2), 46-67. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/2010/3317

Feldstein, M., (2012, November 4). Everyone wants to MOOC the world. [Blog post]. Retrieved from http://mfeldstein.com/everybody-wants-to-MOOC-the-world/.

Ferguson, R., & Sharples, M. (2014). Innovative pedagogy at massive scale: Teaching and learning in MOOCs. In C. Rensing, S. de Freitas, T. Ley, & P. Muñoz-Merino (Eds.), *Open learning and teaching in educational communities* (pp. 98-111). Graz, Austria: Springer International Publishing. http://dx.doi.org/10.1007/978-3-319-11200-8_8

Fine, E., & Handelsman, J. (2010). *Benefits and challenges of diversity of academic settings*. University of Wisconsin-Madison: Women in Science and Engineering

Leadership Institute. Retrieved from http://wiseli.engr.wisc.edu/docs/Benefits_Challenges.pdf

Fischer, C. G., & Grant, G. E. (1983). *Intellectual levels in college classrooms*. Lexington, MA: D.C: Heath.

Flynn, J. T. (2013). MOOCS: Disruptive innovation and the future of higher education. *Christian Education Journal*, *10*(1), 149-162.

Fournier, H., & Kop, R. (2015). MOOC learning experience design: Issues and challenges. *International Journal on E-Learning*, *14*(3), 289-304.

Foster, M. (1995). African American teachers and culturally relevant pedagogy. In J. A. Banks & C.A.M. Banks (Eds.), *Handbook of research on multicultural education* (pp. 570-581). New York: Macmillan.

Gay, G. (2000). *Culturally responsive teaching: Theory, research, and practice*. New York: Teachers College Press.

Gillani, N., & Eynon, R. (2014). Communication patterns in massively open online courses. *The Internet and Higher Education*, *23*, 18-26. http://dx.doi.org/10.1016/j.iheduc.2014.05.004

Goodfellow, R., & Hewling, A. (2005). Reconceptualising culture in virtual learning environments: From an 'essentialist' to a 'negotiated' perspective. *E-Learning*, *2*(4), 355-367. http://dx.doi.org/10.2304/elea.2005.2.4.355

Guido-DiBrito, F., & Chávez, A. F. (2003). Understanding the ethnic self: Learning and teaching in a multicultural world. *Journal of Student Affairs*, *7*, 11-21.

Gunawardena, C., Wilson, P., & Nolla, A., (2003). Culture and online education. In M. Morre & W. Anderson (Eds.), *Handbook of distance education*, (pp. 753-775). Mahwah, NJ: Erlbaum.

Guo, P. J., Kim, J., & Rubin, R. (2014). How video production affects student engagement: An empirical study of MOOC videos. In *Proceedings of the first ACM Conference on Learning@ scale Conference* (pp. 41-50). Atlanta, GA: Learning@ scale.

Haavind, S., & Sistek-Chandler, C. (2015). The emergent role of the MOOC instructor: A qualitative study of trends toward improving future practice. *International Journal on E-Learning*, *14*(3), 331-350.

Hakkarainen, K., (2003). Emergence of progressive-inquiry culture in computer-supported collaborative learning. *Learning Environments Research*, *6*(2), 199-220. http://dx.doi.org/10.1023/A:1024995120180

Hearst, M. A. (2000). The debate on automated essay grading. *IEEE Intelligent Systems and their Applications*, *15*(5), 22-37. http://dx.doi.org/10.1109/5254.889104

Henderson, L. (1996). Instructional design of interactive multimedia: A cultural critique. *Educational Technology Research and Development*, *44*(4), 85-104. http://dx.doi.org/10.1007/bf02299823

Henderson, L. (2007). Theorizing a multiple cultures instructional design model for e-learning and e-teaching. In A. Edmondson (Ed.), *Globalized e-learning cultural challenges* (pp.130-153). Hershey, PA: IGI Global. http://dx.doi.org/10.4018/9781599043012.ch008

Ho, A. D., Chuang, I., Reich, J., Coleman, C., Whitehill, J., Northcutt, C., . . . Petersen, R. (2015). *HarvardX and MITx: Two years of open online courses* (HarvardX Working Paper No. 10). http://dx.doi.org/10.2139/ssrn.2586847

Hofstede, G., & McCrae, R. R. (2004). Personality and culture revisited: Linking traits and dimensions of culture. *Cross-cultural Research, 38*(1), 52-88. http://dx.doi.org/10.1177/1069397103259443

Hollands, F., & Tirthali, D., (2014). *MOOCs - expectations and reality*. Retrieved from: http://www.academicpartnerships.com/sites/default/files/MOOCs_Expectations_and_Reality.pdf

Hollins, E. R. (1996). *Culture in school learning: Revealing the deep meaning*. Mahwah, NJ: Erlbaum.

Hoskins, S. L., & Van Hooff, J. C. (2005). Motivation and ability: Which students use online learning and what influence does it have on their achievement? *British Journal of Educational Technology, 36*(2), 177-192. http://dx.doi.org/10.1111/j.1467-8535.2005.00451.x

Jacoby, J. (2014). The disruptive potential of the Massive Open Online Course: A literature review. *Journal of Open, Flexible, and Distance Learning, 18*(1), 73-85. Retrieved from http://www.jofdl.nz/index.php/JOFDL/article/view/214

Jennings, M. M. (2012). In defense of the sage on the stage: Escaping from the ‘‘sorcery’’ of learning styles and helping students learn how to learn. *Journal of Legal Studies Education*, *29*(2), 191–237. http://dx.doi.org/10.1111/j.1744-1722.2012.01105.x

Johari, A. (2005). Intercultural Internet-based learning: Know your audience and what it values. *Educational Technology Research and Development, 53*(2), 117-127. http://dx.doi.org/10.1007/bf02504870

Joo, J. E. (1999). Cultural issues of the Internet in classrooms. *British Journal of Educational Technology*, *30*(3), 245-250. http://dx.doi.org/10.1111/1467-8535.00113

Jordan, K. (2014). Initial trends in enrolment and completion of massive open online courses. *The International Review of Research in Open and Distributed Learning*, *15*(1), 134-160. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1651

Ke, F., Chávez, A. F., & Herrera, F. (2013). *Web-based teaching and learning across culture and age*. New York: Springer.

Kim, P. (2015). *Massive open online courses: The MOOC revolution*. New York: Taylor & Francis.

Kleinfeld, J. (1975). Effective teachers of Eskimo and Indian students. *School Review*, *83*(2), 301-344. http://dx.doi.org/10.1086/443191

Klobas, J., Mackintosh, B., & Murphy, J. (2014). The anatomy of MOOCs. In P. Kim (Ed.), *Massive open online courses: The MOOC revolution* (p. 1-22). New York: Routledge.

Knox, J., Ross, J., Sinclair, C., Macleod, H., & Bayne, S. (2014). MOOC feedback: Pleasing all the people. In S. Krause & C. Lowe (Eds.), *Invasion of the MOOCs*, (pp. 98-104). Anderson, SC: Parlor Press.

Kobayashi, E., Kerbo, H. R., & Sharp, S. F. (2010). Differences in individualistic and collectivistic tendencies among college students in Japan and the United States. *International Journal of Comparative Sociology*, *51*(1-2), 59-84. http://dx.doi.org/10.1177/0020715209343424

Koedinger, K. R., Stamper, J. C., McLaughlin, E. A., & Nixon, T. (2013, July). Using data-driven discovery of better student models to improve student learning. In *International Conference on Artificial Intelligence in Education* (pp. 421-430). Springer Berlin Heidelberg: International Artificial Intelligence in Education Society. http://dx.doi.org/10.1007/978-3-642-39112-5_43

Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course. *The International Review of Research in Open and Distributed Learning*, *12*(3), 19-38. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/882

Kulkarni, C., Wei, K. P., Le, H., Chia, D., Papadopoulos, K., Cheng, J.... & Klemmer, S. R. (2013). Peer and self-assessment in massive online classes. In H. Plattner, C. Meinel, & L. Leifer (Eds.), *Design thinking research: Building innovators* (pp. 131-168). Stanford, CA: Springer International Publishing. http://dx.doi.org/10.1007/978-3-319-06823-7_9

Ladson-Billings, G. (1994). *The dream-keepers: Successful teachers of African American children*. San Francisco, CA: Jossey-Bass.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, *32*(3), 465-491. http://dx.doi.org/10.3102/00028312032003465

Liyanagunawardena, T., Adams, A., & Williams, S., (2013). MOOCs: A systematic study of the published literature 2008-2012. *The International Review of Research in Open and Distributed Learning*, *14*(3), 202-227. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1455/2531

Llambi, L., Margolis, A., Toews, J., Dapueto, J., Esteves, E., Martinez, E., & Lockyer, J. (2008). Distance education for physicians: Adaptation of a Canadian experience to Uruguay. *Journal of Continuing Education in the Health Professions, 28*(2), 79-85. http://dx.doi.org/10.1002/chp.161

Lodico, M. G., Spaulding, D. T., & Voegtle, K. H. (2010). *Methods in educational research: From theory to practice*. San Francisco, CA: Jossey-Bass.

Long, P., & Siemens, G. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review*, 31-40. Retrieved from http://er.educause.edu/articles/2011/9/penetrating-the-fog-analytics-in-learning-and-education

MacGregor, J., Cooper, J. L., Smith, K. A., & Robinson, P. (Eds.) (2000). *Strategies for energizing large classes: From small groups to learning communities*. San Francisco: Jossey-Bass.

Makoe, M., (2006). South African distance students' accounts of learning in socio-cultural context: A habitus analysis. *Race Ethnicity and Education*, *9*(4), 361-380. http://dx.doi.org/10.1080/13613320600957678

Margaryan, A., Bianco, M., & Littlejohn, A. (2015). Instructional quality of massive open online courses (MOOCs). *Computers & Education*, *80*, 77-83. http://dx.doi.org/10.1016/j.compedu.2014.08.005

Maringe, F., & Jennings, J. (2013). Stigma, tensions, and apprehension: The academic writing experience of international students. *International Journal of Education Management, 29*(5), 609-626. http://dx.doi.org/10.1108/ijem-04-2014-0049

Maringe, F., & Sing, N. (2014). Teaching large classes in an increasingly internationalising higher education environment: Pedagogical, quality and equity

issues. *Higher Education*, *67*(6), 761-782. http://dx.doi.org/10.1007/s10734-013-9710-0

Marshall, S. (2013). Evaluating the strategic and leadership challenges of MOOCs. *MERLOT Journal of Online Learning and Teaching*, *9*(2), 216–227. Retrieved from http://jolt.merlot.org/vol9no2/marshall_0613.htm

Martin, F. G. (2012). Will massive open online courses change how we teach? *Communications of the ACM*, *55*(8), 26-28. http://dx.doi.org/10.1145/2240236.2240246

Matsumoto, D. (2006). Culture and nonverbal behavior. In V. L. Manusov & M. L. Patterson (Eds.), *The SAGE handbook of nonverbal communication* (pp. 219-236). Thousand Oaks, CA: Sage Publications.

McGivney, V. (2004). Understanding persistence in adult learning. *Open Learning*, *19*(1), 33-46. http://dx.doi.org/10.1080/0268051042000177836

McLoughlin, C. (2007). Adapting e-learning across cultural boundaries: A framework for quality learning, pedagogy, pedagogy, and interaction. In A. Edmundson (Ed.), *Globalized e-learning cultural challenges* (pp. 223-238). Hershey, PA: Information Science Publishing.

McLoughlin, C., & Oliver, R. (2000). Designing learning environments for cultural inclusivity: A case study of indigenous online learning at tertiary level. *Australasian Journal of Educational Technology*, *16*(1), 58-72. http://dx.doi.org/10.14742/ajet.1822

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.

Merriam-Webster's Online Dictionary (n.d.). Culture. Retrieved May 7, 2016, from

http://www.merriam-webster.com/dictionary/culture

Merriam-Webster's Online Dictionary (n.d.). Learn. Retrieved May 7, 2016, from http://www.merriam-webster.com/dictionary/learn

Merrill, M. D. (2002). First principles of instruction. *Educational Technology Research and Development*, *50*(3), 43-59. http://dx.doi.org/10.1007/bf02505024

Merrill, M. D. (2009). First principles of instruction. In C. M. Reigeluth, & A. Carr (Eds.), *Instructional design theories and models: Building a common knowledge base* (Vol. 3, pp. 3-26). New York: Routledge/Taylor and Francis. http://dx.doi.org/10.4324/9780203872130

Merrill, M. D. (2013). *First principles of instruction: Identifying and designing effective, efficient and engaging instruction*. Hoboken, NJ: Pfeiffer/John Wiley & Sons.

Nieto, S. (1999). *The light in their eyes: Creating multicultural learning communities.* New York: Teachers College Press.

Papadimitriou, A., Grigoriadou, M., & Gyftodimos, G. (2014). A web-based learner-controlled adaptive group formation technique. *International Journal of e-Collaboration, 10*(1), 14-34. http://dx.doi.org/10.4018/ijec.2014010102

Penner, J. G. (1984). *Why many college teachers cannot lecture: How to avoid communication breakdown in the classroom*. Springfield: Charles C. Thomas.

Phan, T., McNeil S., & Robin, B. (2016). Students' patterns of engagement and course performance in a massive open online course. *Computers & Education*, *95*, 36-44. http://dx.doi.org/10.1016/j.compedu.2015.11.015

Pomerol, J. C., Epelboin, Y., & Thoury, C. (2015). *MOOCs: Design, use and business models*. New Jersey: John Wiley & Sons, Inc.

Queensborough Community College (n.d.). Definition for diversity. Retrieved from

http://www.qcc.cuny.edu/diversity/definition.html

Rasmussen, K. L., Nichols, J. C., & Ferguson, F. (2006). It's a new world: Multiculturalism in a virtual environment. *Distance Education, 27*(2), 265-278. http://dx.doi.org/10.1080/01587910600789696

Reeves, T. C., & Hedberg, J. G. (2014). MOOCs: Let's get REAL. *Educational Technology*, *54*(1), 3-8.

Reeves, T. C., & Reeves, P. M. (1997). Effective dimensions of interactive learning on the World Wide Web. In B. Khan (Ed.), *Web-based instruction* (pp. 59-66). Eaglewood Cliffs: Educational Technology Publications.

Rensing, C., de Freitas, S., Ley, T., & Muñoz-Merino, P. J. (Eds.). (2014). Open Learning and Teaching in Educational Communities. *Proceedings in the 9th European Conference on Technology Enhanced Learning, EC-TEL 2014*. Graz, Austria: Springer.

Richardson, J., & King, E. (1998). Adult students in higher education: Burden or boon. *Journal of Higher Education*, *69*, 65-89. http://dx.doi.org/10.2307/2649182

Rivard, R. (2013). Learning how to teach. *Inside Higher Ed*. Retrieved from https://www.insidehighered.com/news/2013/03/05/moocs-prompt-some-faculty-members-refresh-teaching-styles

Robin, B., & McNeil, S. (2015). Webscapes: An academic vision for digital humanities projects on the web. *Book 2.0*, *4*(1-2), 121-141. http://dx.doi.org/10.1386/btwo.4.1-2.121_1

Rodriguez, O. 2012. MOOCs and the AI-Stanford like courses: Two successful and distinct course formats for massive open online courses. *European Journal of*

Open, Distance and E-learning 2012. Retrieved from http://www.eurodl.org/?article=516

Shinkareva, O., & Benson, A. (2007). The relationship between adult students' instructional technology competency and self-directed learning ability in an online course. *Human Resource Development International, 10*(4), 417-435. http://dx.doi.org/10.1080/13678860701723737

Siemens, G. (2012). *Connectivist learning theory*. Retrieved from the P2P Foundation Wiki: http://p2pfoundation.net/Connectivist_Learning_Theory_-_Siemens

Siemens, G. (2015, October). *Learning with MOOCs 2015 | George Siemens | Keynote Presentation* [video file]. Retrieved from https://www.youtube.com/watch?v=Gz6GxseTviY

Smith, D., & Ayers, D. (2006). Culturally responsive pedagogy and online learning: Implications for the globalized community college. *Community College Journal of Research and Practice, 30*(5-6), 401-415. http://dx.doi.org/10.1080/10668920500442125

Stake, R. E. (1995). *The art of case study research*. New York, NY: Guilford Press.

Stake, R. E. (2006). *Multiple case study analysis*. New York, NY: Guilford Press.

Stanley, L.E. (2015). *A qualitative study of instructional design in massive open online courses (MOOCs)* [Unpublished doctoral dissertation]. Capella University, Minnesota.

Stewart, B. (2013). Massiveness + openness = new literacies of participation? *MERLOT Journal of Online Learning and Teaching, 9*(2), 228–238. Retrieved from http://jolt.merlot.org/vol9no2/stewart_bonnie_0613.htm

Stones, E. (1970). Students' attitudes toward the size of teaching groups. *Educational Review, 21*(2), 98-108. http://dx.doi.org/10.1080/0013191690210202

Suinn, R. M. (2006). Teaching culturally diverse students. In W.J. McKeachie, M.D. Svinicki & B. K. Hofer (Eds.), *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (12th Ed.) (pp. 152-171). Boston: Houghton Mifflin.

TED Caltech the Brain (n.d.). What is TEDx? Retrieved from http://tedxcaltech.caltech.edu/content/s-george-djorgovski

Terras, M.M., & Ramsay, J. (2015). Massive open online courses (MOOCs): Insights and challenges from a psychological perspective. *British Journal of Educational Technology*, *46*(3), 472-487. http://dx.doi.org/10.1111/bjet.12274

Thompson, J. J. (1973). *Beyond words: Nonverbal communication in the classroom*. New York: Citation Press.

Tinapple, D., Olson, L., & Sadauskas, J. (2013). CritViz: Web-based software supporting peer critique in large creative classrooms. *Bulletin of the IEEE Technical Committee on Learning Technology*, *15*(1), 29. Retrieved from www.ieeetclt.org/issues/january2013/Tinapple.pdf

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: The University of Chicago.

Tomkin, J. H., & Charlevoix, D. (2014). Do professors matter? Using an a/b test to evaluate the impact of instructor involvement on MOOC student outcomes. In *Proceedings of the First ACM Conference on Learning@ scale Conference* (pp. 71-78). Atlanta, GA: Learning@ scale.

Tschofen, C., & Mackness, J. (2012). Connectivism and dimensions of individual experience. *The International Review of Research in Open and Distributed Learning*, *13*(1), 124-143. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1143/2086

Van den Branden, J., & Lambert, J. (1999). Cultural issues related to transnational open and distance learning in universities: A European problem? *British Journal of Educational Technology*, *30*(3), 251-260. http://dx.doi.org/10.1111/1467-8535.00114

Vandermensbrugghe, J. (2004). The unbearable vagueness of critical thinking in the context of the Anglo-Saxonisation of education. *International Education Journal*, *5*(3), 417-422. Retrieved from http://ehlt.flinders.edu.au/education/iej/articles/v5n3/vandermensbrugghe/paper.pdf

Vaquero, L. M., & Cebrian, M. (2013). The rich club phenomenon in the classroom. *Scientific Reports*, *3*, 1-8. http://dx.doi.org/10.1038/srep01174

Vihavainen, A., Luukkainen, M., & Kurhila, J. (2012, October). Multi-faceted support for MOOC in programming. In *Proceedings of the 13th Annual Conference on Information Technology Education* (pp. 171-176). Canada: SIGITE/RIIT 2012.

Walqui, A., & Heritage, M. (2012). Instruction for diverse groups of English language learners. Paper presented at the *Understanding Language Conference*. Stanford, CA: Understanding Language. Retrieved from http://ell.stanford.edu/publication/instruction-diverse-groups-ells

Wang, C. M., & Reeves, T. C. (2007). The meaning of culture in online education: Implications for teaching, learning, and design. In A. Edmundson (Ed.), *Globalized e-learning cultural challenges* (pp. 1-17). Hershey, PA: Information

Science Publishing.

Wang, M. (2007). Designing online courses that effectively engage learners from diverse cultural backgrounds. *British Journal of Educational Technology*, *38*(2), 294-311. http://dx.doi.org/10.1111/j.1467-8535.2006.00626.x

Wang, F., & Hannafin, M. J. (2005). Design-based research and technology-enhanced learning environments. *Educational Technology Research and Development*, *53*(4), 5-23. http://dx.doi.org/10.1007/bf02504682

Wardle, F., & Cruz-Janzen, M. (2004). *Meeting the needs of multiethnic and multiracial children in schools.* Boston, MA: Pearson Education, Inc.

Willis, J. (1995). A recursive, reflective instructional design model based on constructivist-interpretivist theory. *Educational Technology*, *35*(6), 5-23.

Wong, J. K. K. (2004). Are the learning styles of Asian international students culturally or contextually based? *International Education Journal*, *4*(4), 154-166. Retrieved from http://ehlt.flinders.edu.au/education/iej/articles/v4n4/wong/Begin.htm

Wong, L. F., & Trinidad, S. G. (2004). Using web-based distance learning to reduce cultural distance. *The Journal of Interactive Online Learning*, *3*(1), 1-13. Retrieved from http://www.ncolr.org/issues/jiol/v3/n1/using-web-based-distance-learning-to-reduce-cultural-distance

Wulf, J., Blohm, I., Leimeister, J. M., & Brenner, W. (2014). Massive open online courses. *Business & Information Systems Engineering*, *6*(2), 111-114. http://dx.doi.org/10.1007/s12599-014-0313-9

Wulff, D. H., Nyquist, J. D., & Abbott, R. D. (1987). Students' perceptions of large classes. *New Directions for Teaching and Learning*, *1987*(32), 17–30. http://dx.doi.org/10.1002/tl.37219873204

Yang, B., Zheng, W., & Li, M. (2006). Confucian view of learning and implications for developing human resources. *Advances in Developing Human Resources, 8*(3), 346-354. http://dx.doi.org/10.1177/1523422306288427

Yin, R. K. (2014). *Case study research: Design and methods* (5th Ed.). Los Angeles, CA: Sage.

Young, J. R. (2012). *Why do students flock to MOOCs*? [Audio Interviews]. Retrieved from http://www.eurodl.org/?article=516

Yuan, L., & Powell, S. (2013). *MOOCS and open education: Implications for higher education*. [White paper]. University of Bolton, UK. Retrieved from http://publications.cetis.ac.uk/2013/667

Zhang, Y. (2013). Benefiting from MOOC. In J. Herrington, A. Couros & V. Irvine (Eds.), *Proceedings of EdMedia: World Conference on Educational Media and Technology 2013* (pp. 1372-1377). Association for the Advancement of Computing in Education (AACE): Victoria, British Columbia.

Appendix A

Interview Protocol

Researcher Name(s):

Mode of communication (Phone, Skype, face-to-face meeting and location):

Participant Name:

Job title:

Institution/department:

Date:

Start time: End time:

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1. What is your institution doing currently with respect to MOOCs?
2. What are the primary goals of your institution in pursuing MOOCs?
3. What is your role in this work and how did this role develop?
4. How do you and your institution define a MOOC?
5. For specific MOOCs:
    - What MOOC is your institution developing at the moment?
    - What are the educational objectives of the MOOC(s) you are offering?
    - Who is the target audience for your MOOC(s)?
    - What educational outcomes are being measured? (Rate of completion? Number of students receiving certificates? Or the degree of participation of the learners? (I.e. numbers of students participating in an activity? Number of views on the materials?)

6. Students attending your course come from different cultures and diverse background. In what way does your curriculum deal with diversity/diverse populations?
7. What data are you collecting for your MOOC(s)? (I.e. pre-, post- and during the course, enrollment, demographics of participants, reasons for taking course, participation, test scores, completion, post-course applications (networking, pursuit of further study, employer acceptance of any credentials).
8. Can you share with us some demographic information of the audience in the MOOC(s) you are offering?
9. How is data collected from MOOCs being used to improve pedagogy either online or on-campus?
10. How do you think the following factors will possibly affect student's learning behaviors and their participation in a MOOC?
    - Language & ethnicity background
    - Education level
    - Employment status
    - Gender
    - Age
11. Which of the above issues did you address in designing your MOOC activities? Can you please give some examples?

Appendix B

Participants' Professional Profiles

Participant 1. Participant 1 is a male American astrophysicist and a professor of Astronomy at the California institute of technology. He has worked on astronomy and cosmology topics, including galaxy formation and evolution, fundamental properties of early-type galaxies, distant quasars, cosmic gamma-ray bursts, gravitational lenses, globular clusters, digital sky surveys, etc. He is one of the founders of Virtual Observatory concept and pioneered the uses of machine learning tools for analysis of large digital sky surveys. His research interests involve the ways information and computation technologies change the ways science is done. His current project involves establishing Astroinformatics, a bridge discipline between astronomy and applied computer science and information technology. (http://www.astro.caltech.edu/~george/Djorgovski_CV_2pages.pdf).

Participant 2. Participant 2 is a female assistant research professor in the department of Cell Biology at Duke University. She has been teaching medical students at Medical Center of Duke University for the past 6 years and *Introduction to Physiology* course to graduate and undergraduate students. She is currently the course director of the cell biology portion of the Duke medical school course, Molecule and Cells. (https://www.coursera.org/instructor/~12).

Participant 3. Participant 3 is a female associate research professor in the department of Cell Biology at Duke University. She has been teaching cell biology and cell/systems physiology to graduate students and medical students at Duke University Medical Center and others for more than 20 years and is the co-author of the book

Physiology: Review for the National Boards. She has received several teaching awards including Golden Apples and Master Clinician/Teacher Award from Duke University Medical School. She is currently the course director and course coordinator of the Duke medical school course, Normal Body, and the course director of two graduate courses, Human Structure and Function and Introductory Physiology. (https://www.coursera.org/instructor/~13).

Participant 4. Participant 4 is a male associate professor from Duke University School of Medicine. He studies brain development in early life and the relationships between the structure of neural circuits and the functional properties they generate. His research has been published on top scientific journals and he is the co-author of a digital atlas of the human brain (Sylvius) and co-editor and co-author of a leading textbook in the field (Neuroscience, Sinauer Assoc., Inc.). He directs on-campus versions of this online course for first-year medical and physical therapy students in the Duke University School of Medicine. He is the recipient of the Excellence in Teaching Award from physical therapy students, the Golden Apple Award from medical students, and the Master Clinician/Teacher Award from the Duke University School of Medicine. (https://dibs.duke.edu/scholars/leonard-white).

Participant 5. Participant 5 is a male adjunct assistant research scientist at the Joint Program in survey methodology at the University of Maryland. His research focuses on various questions around Web survey methodology and visual design effects in questionnaire design. It centers around two aspects of survey methodology: (1) factors influencing nonresponse and measurement error in Web surveys and (2) visual design effects on rating scales and open-ended questions. (http://jointprogram.umd.edu/keusch).

Participant 6. Participant 6 is a female mathematician and computer scientist. She is an assistant teaching professor in the Computer Science and Engineering Department at the University of California, San Diego (UCSD). Her research focus is on the theory of computation, mathematical logic, and algorithmic randomness. She develops curricula and university programs on algorithms, problem solving, the overlap between math and computer science, and writing in the discipline. Her work has been supported by several grants from the National Science Foundation. She has taught many different courses in mathematics and computer science, ranging from large-lecture introductory courses for freshmen to senior undergraduate and graduate seminars. She was awarded the Best Teacher award 2013-2014 in the Jacobs School of Engineering at UCSD. (http://cseweb.ucsd.edu/~minnes/).

Participant 7. Participant 7 is a female instructor and director of START's (Study of Terrorism and Responses to Terrorism) Education in the Terrorism Studies program at the University of Maryland's (UMD). She directs and teaches in the UMD's Global Terrorism Minor and Graduate Certificate in Terrorism Analysis. She also directs START's Terrorism Research Award Program, Undergraduate Research Program, and Career Development Programs and works with UMD and consortium faculty and researchers to develop innovative approaches to terrorism studies education. She also works as an instructional designer, collaborating with other faculty researchers to develop professional training programs based on START-sponsored research, including trainings related to Countering Violent Extremism (CVE) programming, risk communication, cybersecurity, and empirical analysis of terrorism data. She serves on committees for undergraduate and graduate programs, and serves as the Dean's representative on the

Provost's Commission on Learning Outcomes Assessment and holds faculty affiliations in the UMD's Department of Anthropology and Honors College. (https://www.start.umd.edu/people/katherine-worboys-izsak).

Participant 8. Participant 8 is a female visiting associate professor of medicine at the University of California San Francisco (UCSF), division of medical genetics. She currently leads the development and implementation of the precision medicine education at UCSF, including courses and webinars for practicing health care providers. She has published on over 50 peer-reviewed journals on her research areas of genetic underpinnings of infectious and chronic diseases and recently co-authored a comprehensive review on the field of genomic medicine, published in Science Translational Medicine. In addition to her work at UCSF, she is an adjunct associate professor at the Duke University Center for Personalized and Precision Medicine, editor-in-chief of a patient-centered magazine from Big Science Media, Genome, aimed at educating and informing patients in the area of genomic medicine, and a consultant in precision medicine education. (https://www.coursera.org/instructor/~1833).

Participant 9. Participant 9 is a male professor emeritus in the History Department who has been teaching Russian and modern European history at the University of California, Santa Cruz (UCSC) since 1966. His research interests include Russian history, Eastern Europe, 20th-century Europe and Soviet film. At UCSC, he has taught courses in each of those areas, as well as modern European history, the Holocaust and Jewish social history. He is the recipient of an Excellence in teaching award. He is a native of Hungary and a Holocaust survivor and the author of eight books, including *A History of the Soviet Union from the beginning to the end* and the *autobiographical*

Varieties of Fear: Growing up Jewish under Nazism and Communism. His most recent work is entitled *From Antisemitism to Genocide; the Origins of the Holocaust.* (http://history.ucsc.edu/faculty/profiles/singleton.php?&singleton=true&cruz_id=kenez).

Participant 10. Participant 10 is a male researcher, a professor, an administrator, Vice President for Student Affairs and a member of the faculty of the College of Education at the University of New Mexico. Growing up on the border of Texas and Mexico, he has been fascinated by the folk traditions and folkways of Mexico and of his Mexican American roots. Both of his parents were into herbal lore and healing, and as he matured he learned to love and respect the history and folk knowledge of the ancient art of Curanderismo, the Mexican folk healing. He regularly lectures and gives presentations on the history of Curanderismo to scholars and students of Latin American culture, lay people who want knowledge about traditional medicine and medical professionals. He has published two books on his life and his research area: *Curandero*: *A Life in Mexican Folk Healing*, and *Healing with Herbs and Rituals: A Mexican Tradition*, both available on the University of New Mexico Press. (https://www.coursera.org/instructor/cheotorres).

Participant 11. Participant 11 is a female medical doctor and a clinical assistant professor, Ophthalmology and Visual Sciences at the University of Michigan. She practices general ophthalmology at a satellite clinic of the Kellogg Eye Center in Northville, Michigan and supervises residents from the University of Michigan Ophthalmology Residency program. She has collaborated with several renowned ophthalmologists to put together a comprehensive course that provided fundamental knowledge needed to begin performing cataract surgery by phacoemulsification and extra capsular removal. (http://kellogg.umich.edu/bios/du.html).

Participant 12. Participant 12 is a male associate professor of Learning, Design and Technology at the University of Houston. He teaches traditional and online courses on the integration of technology into the curriculum and educational uses of multimedia, educational uses of multimedia tools including, digital storytelling, digital video, and digital photography. He is an internationally recognized leader in the educational uses of digital storytelling and has been delivering courses, conducting workshops, writing articles, and supervising graduate student research on this topic for more than a decade. The Educational Uses of Digital Storytelling (EUODS) website (http://digitalstorytelling.coe.uh.edu/) that he created serves as a resource for educators and students interested in how digital storytelling can be integrated into educational activities. The EUODS website presents digital stories on a wide range of subjects and provides detailed information about tools and techniques for creating digital stories to support teaching and learning, as well as descriptions and links to other digital storytelling websites, published articles, research studies, e-books and more. The EUODS website was the 2009 recipient of the MERLOT Faculty Development Award for Exemplary Online Materials, a peer-reviewed award for exemplary online materials and learning resources. (http://faculty.coe.uh.edu/brobin/homepage/).

Participant 13. Participant 13 is a male medical director, a nurse practitioner and an assistant clinical professor at College of Nursing, University of New Mexico. He has been in clinical practice for over 20 years, primarily in rural, frontier and urban underserved populations in the Deep South and on the west coast and practiced mission clinics in the Caribbean and South America. His clinical and research interests include health care systems, rural health, clinical decision-making, Native American health, and

homeless health. His current research includes e-Mentoring, diabetes among Native Americans, and the study of the use of evidence-based practice and clinical decision-making among nurse practitioners. (http://unmmg.org/findadoc/details.cfm?dockey=1851375976).

Participant 14. Participant 14 is a male professor of economics who has taught economics and social studies at Wesleyan University since 1975, and twice received the University's annual Binswanger Award for Excellence in Teaching respectively in 1993, and in 2012. His teaching and scholarly interests lie at the intersection of economics, law, history and philosophy, and historical development of social institutions and the problem of how social order is created and maintained. He has been a pioneer in the application of economic analysis to legal problems and published extensively on scholarly journals and books in a range of disciplines. (https://www.coursera.org/instructor/~234).

Participant 15. Participant 15 is a distinguished male university professor in the Departments of Organizational Behavior, Psychology, and Cognitive Science at Case Western Reserve University. His research focuses on sustained, desired change at all levels of human endeavor from individuals, teams, organizations, communities, countries and global change. He is the author of more than 150 articles on leadership, competencies, emotional intelligence, competency development, coaching, and management education and was ranked number 9 most influential international thinkers by an 11,000 HR Director Survey in HR (Society for Human Resources) Magazine. His books include: *The Competent Manager*; the international best-seller, *Primal Leadership* with Daniel Goleman and Annie McKee (in 28 languages); *Resonant Leadership*, with Annie McKee (in 18 languages); and *Becoming a Resonant Leader*, with Annie McKee

and Fran Johnston (in 7 languages).

(https://www.coursera.org/instructor/richardboyatzis).

Appendix C

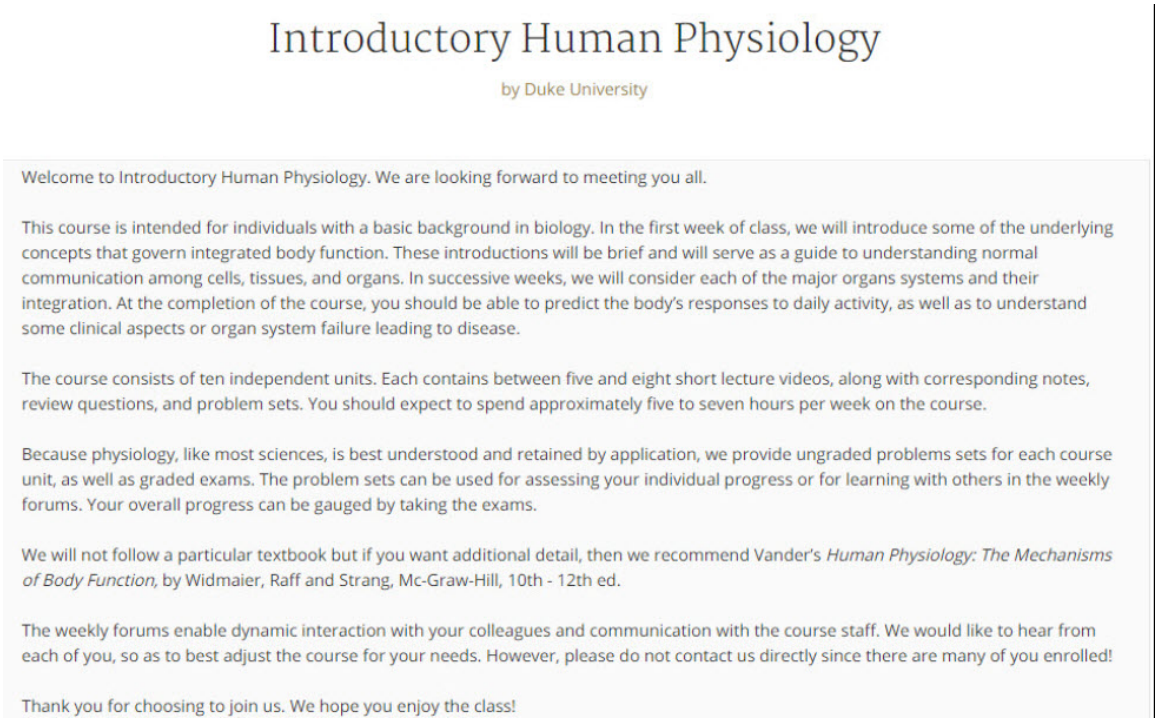
List of the Investigated MOOCs on the Coursera Platform

Participant 1. Galaxies and Cosmology

https://www.mooc-list.com/course/galaxies-and-cosmology-coursera?static=true

Participants 2 and 3. Introduction to Human Physiology

https://www.coursera.org/learn/physiology



Introductory Human Physiology

by Duke University

Welcome to Introductory Human Physiology. We are looking forward to meeting you all.

This course is intended for individuals with a basic background in biology. In the first week of class, we will introduce some of the underlying concepts that govern integrated body function. These introductions will be brief and will serve as a guide to understanding normal communication among cells, tissues, and organs. In successive weeks, we will consider each of the major organs systems and their integration. At the completion of the course, you should be able to predict the body's responses to daily activity, as well as to understand some clinical aspects or organ system failure leading to disease.

The course consists of ten independent units. Each contains between five and eight short lecture videos, along with corresponding notes, review questions, and problem sets. You should expect to spend approximately five to seven hours per week on the course.

Because physiology, like most sciences, is best understood and retained by application, we provide ungraded problems sets for each course unit, as well as graded exams. The problem sets can be used for assessing your individual progress or for learning with others in the weekly forums. Your overall progress can be gauged by taking the exams.

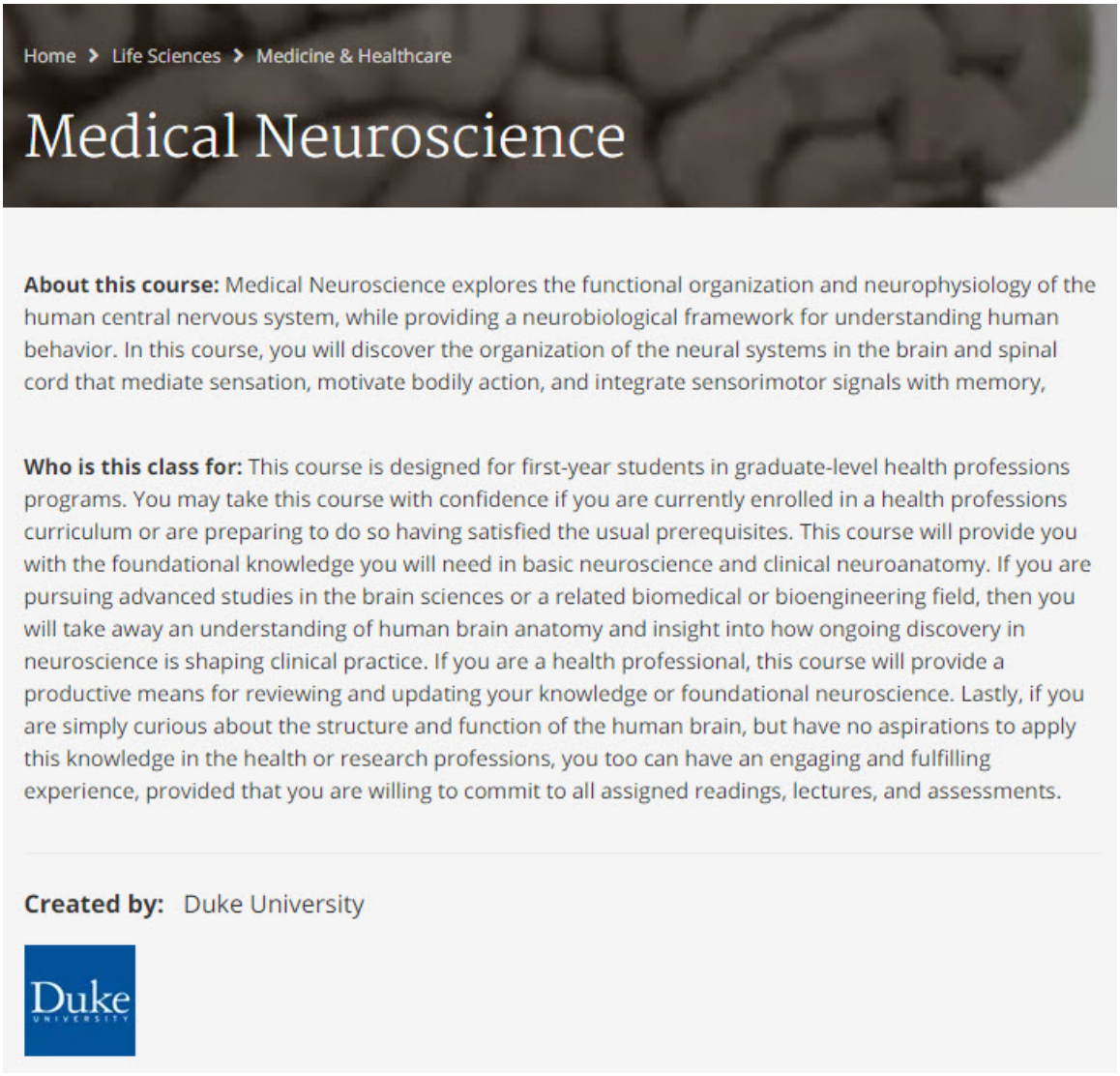
We will not follow a particular textbook but if you want additional detail, then we recommend Vander's *Human Physiology: The Mechanisms of Body Function,* by Widmaier, Raff and Strang, Mc-Graw-Hill, 10th - 12th ed.

The weekly forums enable dynamic interaction with your colleagues and communication with the course staff. We would like to hear from each of you, so as to best adjust the course for your needs. However, please do not contact us directly since there are many of you enrolled!

Thank you for choosing to join us. We hope you enjoy the class!

Participant 4. Medical Neuroscience

https://www.coursera.org/learn/medical-neuroscience

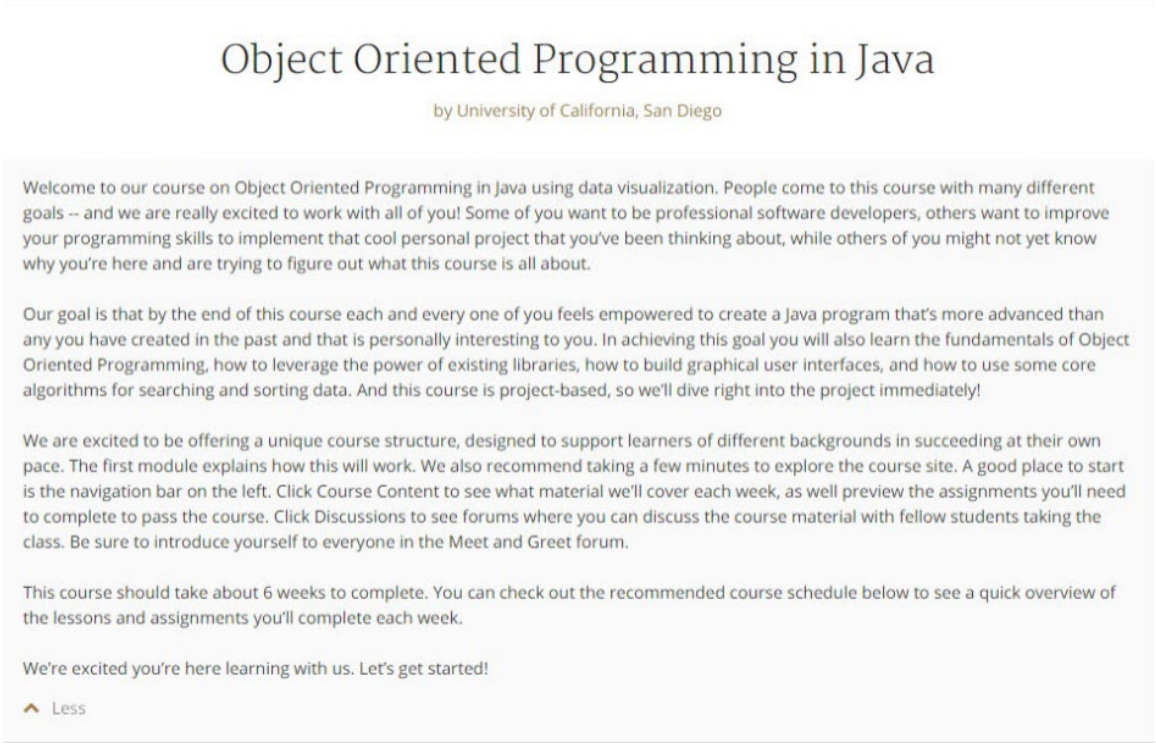


Participant 5. Questionnaire Design for Social Survey

https://www.coursera.org/learn/questionnaire-design

Participant 6. Specialization in Intermediate Java Software Engineering

https://www.coursera.org/learn/object-oriented-java



Object Oriented Programming in Java

by University of California, San Diego

Welcome to our course on Object Oriented Programming in Java using data visualization. People come to this course with many different goals -- and we are really excited to work with all of you! Some of you want to be professional software developers, others want to improve your programming skills to implement that cool personal project that you've been thinking about, while others of you might not yet know why you're here and are trying to figure out what this course is all about.

Our goal is that by the end of this course each and every one of you feels empowered to create a Java program that's more advanced than any you have created in the past and that is personally interesting to you. In achieving this goal you will also learn the fundamentals of Object Oriented Programming, how to leverage the power of existing libraries, how to build graphical user interfaces, and how to use some core algorithms for searching and sorting data. And this course is project-based, so we'll dive right into the project immediately!

We are excited to be offering a unique course structure, designed to support learners of different backgrounds in succeeding at their own pace. The first module explains how this will work. We also recommend taking a few minutes to explore the course site. A good place to start is the navigation bar on the left. Click Course Content to see what material we'll cover each week, as well preview the assignments you'll need to complete to pass the course. Click Discussions to see forums where you can discuss the course material with fellow students taking the class. Be sure to introduce yourself to everyone in the Meet and Greet forum.

This course should take about 6 weeks to complete. You can check out the recommended course schedule below to see a quick overview of the lessons and assignments you'll complete each week.

We're excited you're here learning with us. Let's get started!

Less

https://www.coursera.org/learn/advanced-data-structures

Advanced Data Structures in Java

by University of California, San Diego

Welcome to the third course in our Intermediate Programming in Java specialization. Some of you are just joining us (welcome!) while others we now consider "loyal followers" (thank you!). We know you're one of a diverse group of learners with a diverse set of goals, and just like in our previous courses, we'll do our best to meet your unique needs.

This course is titled "Advanced Data Structures in Java", but as we were designing it we realized that one data structure in particular was so fundamental that it deserved an entire course. That data structure (or more accurately, abstract data type) is the graph. We'll look at graph representation, implement fundamental graph algorithms and analyze their running times, and introduce you to some graph problems that are so difficult (yet important) that no one knows how to solve them in a reasonable amount of time! They fall into a class of problems which are called "NP-Hard", and many people spend their entire careers just studying these problems, so there's lots of exciting stuff there.

Like in our last courses, we've got another real-world project for you. In this course you'll be creating the back end of a mapping application, inspired by Google Maps. In fact, we're even providing you with a front end that uses the Google Maps API, so it will really feel like you are implementing your very own Google Maps.

We've also brought back our unique course structure, designed to support learners of different backgrounds in succeeding at their own pace, and to inspire everyone with stories from Google engineers about why this stuff really matters. The first module explains how this all will work. We also recommend taking a few minutes to explore the course site. A good place to start is the navigation bar on the left. Click Course Content to see what material we'll cover each week, as well as to preview the assignments you'll need to complete to pass the course. But it's not just about passing--it's about learning and having fun. Along those lines, get to know your peers taking the course in the Discussion forum (we instructors pop on there too from time to time). Be sure to introduce yourself to everyone in the Meet and Greet forum.

This course should take about 5 weeks to complete. You can check out the recommended course schedule below to see a quick overview of the lessons and assignments you'll complete each week.Notice that the last week is very open ended and we encourage you to take the project in a direction that's personally interesting to you.

We hope you're looking forward to this course as much as we are!

https://www.coursera.org/learn/cs-tech-interview

Mastering the Software Engineering Interview

by University of California, San Diego

Welcome to the fourth and final course in our Intermediate Programming in Java specialization. Some of you are just joining us (welcome!) and we welcome back our loyal followers. :)

This course is all about mastering the software engineering interview. You'll combine all of the technical skills you've learned in your software engineering career so far, and learn how to apply them to stand out in the interview process. We'll examine the structure of a technical interview and look at the role of "soft skills" combined with technical skills in acing the interview. Unlike the many YouTube videos and written resources on this topic, this course will give you the ability to practice to improve the skills you need through a carefully designed series of assessments.

Although this course does not have a single backbone project like our previous three courses, you'll still recognize many of our unique video series such as "When I Struggled" and "In the Real World". In fact, you'll see content provided by engineers and recruiters at Google throughout the course.

This course should take about 4 weeks to complete. You can check out the recommended course schedule below to see a quick overview of the lessons and assignments you'll complete each week.

You'll get out of the course what you put into it--many of the assignments are self-assessed. We hope you will take them seriously to get the most out of them. But while we encourage you to take the assignments seriously, we won't be offended if you choose not to do them for whatever reason. There's still a lot you can get out of the course, and if you're just looking to get to the capstone project and aren't really that interested in interview skills that's fine too. (We're really excited about the capstone project too!)

This course has been a unique and exciting experience for us to create and we hope you get a lot out of it, whatever you are looking for. Welcome to our course!

https://www.coursera.org/learn/data-structures-optimizing-performance

Data Structures Made Easy

by University of California, San Diego

Welcome to the second course in our Intermediate Programming in Java specialization. Whether you were with us for our first course, or are just joining us now, we're glad you're here! We know you're one of a diverse group of learners with a diverse set of goals, and we'll do our best to meet your unique needs.

This course will focus on some basic fundamental data structures including linked lists and trees, and go on to touch on more advanced structures like hashsets and tries. And front and center throughout this course will be the subject of code and algorithm efficiency and correctness. In this course, you'll learn to ensure that you've written CORRECT CODE that RUNS FAST!

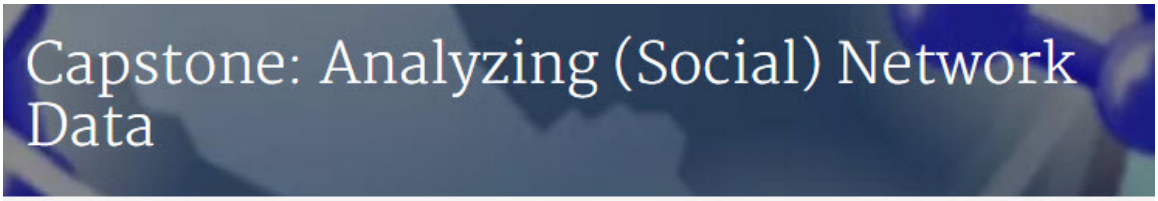
Just like in our first course, you'll learn everything in the context of a super-cool project: a text editor complete with spell checking, auto-complete and spelling suggestions, as well as some fun, like text readability measurement and "intelligent" text generation.

We've also brought back our unique course structure, designed to support learners of different backgrounds in succeeding at their own pace, and to inspire everyone with stories from Google engineers about why this stuff really matters. The first module explains how this all will work. We also recommend taking a few minutes to explore the course site. A good place to start is the navigation bar on the left. Click Course Content to see what material we'll cover each week, as well as to preview the assignments you'll need to complete to pass the course. It might feel like a lot, but we hope you'll get as carried away with the course as we did when designing it! Finally, click Discussions to see forums where you can discuss the course material with fellow students taking the class. Be sure to introduce yourself to everyone in the Meet and Greet forum.

This course should take about 5 weeks to complete. You can check out the recommended course schedule below to see a quick overview of the lessons and assignments you'll complete each week. Notice that we have a couple optional programming assignments, and some ungraded extensions to the required assignments for those of you who just can't get enough.

So... are you ready to go? We are too! See you in the course!

https://www.coursera.org/learn/intermediate-programming-capstone



About this course: In this capstone project we'll combine all of the skills from all four specialization courses to do something really fun: analyze social networks!

The opportunities for learning are practically endless in a social network. Who are the "influential" members of the network? What are the sub-communities in the network? Who is connected to whom, and by how many links? These are just some of the questions you can explore in this project.

We will provide you with a real-world data set and some infrastructure for getting started, as well as some warm up tasks and basic project requirements, but then it'll be up to you where you want to take the project. If you're running short on ideas, we'll have several suggested directions that can help get your creativity and imagination going. Finally, to integrate the skills you acquired in course 4 (and to show off your project!) you will be asked to create a video showcase of your final product.

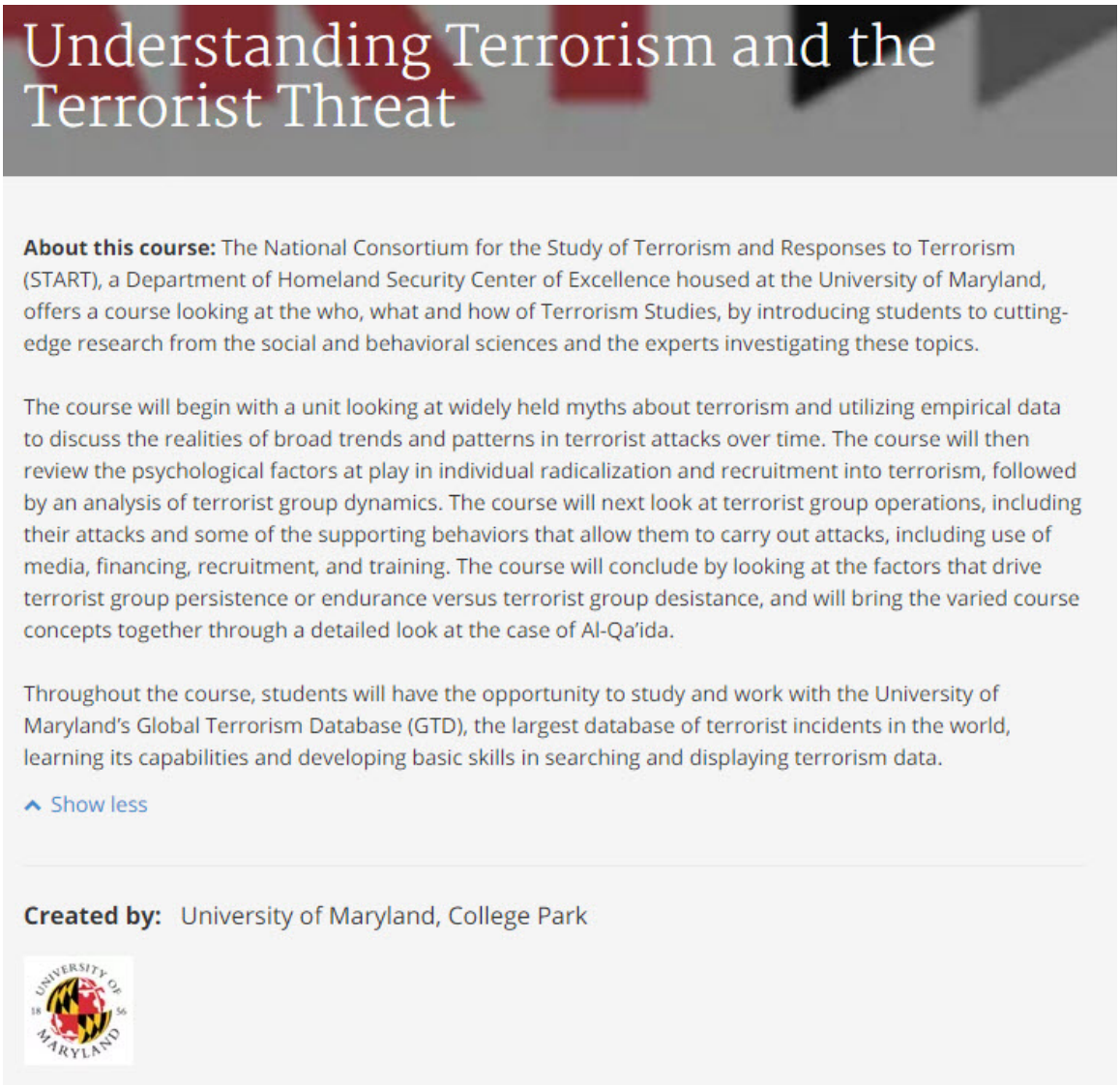
Show less

Created by: University of California, San Diego

UC San Diego

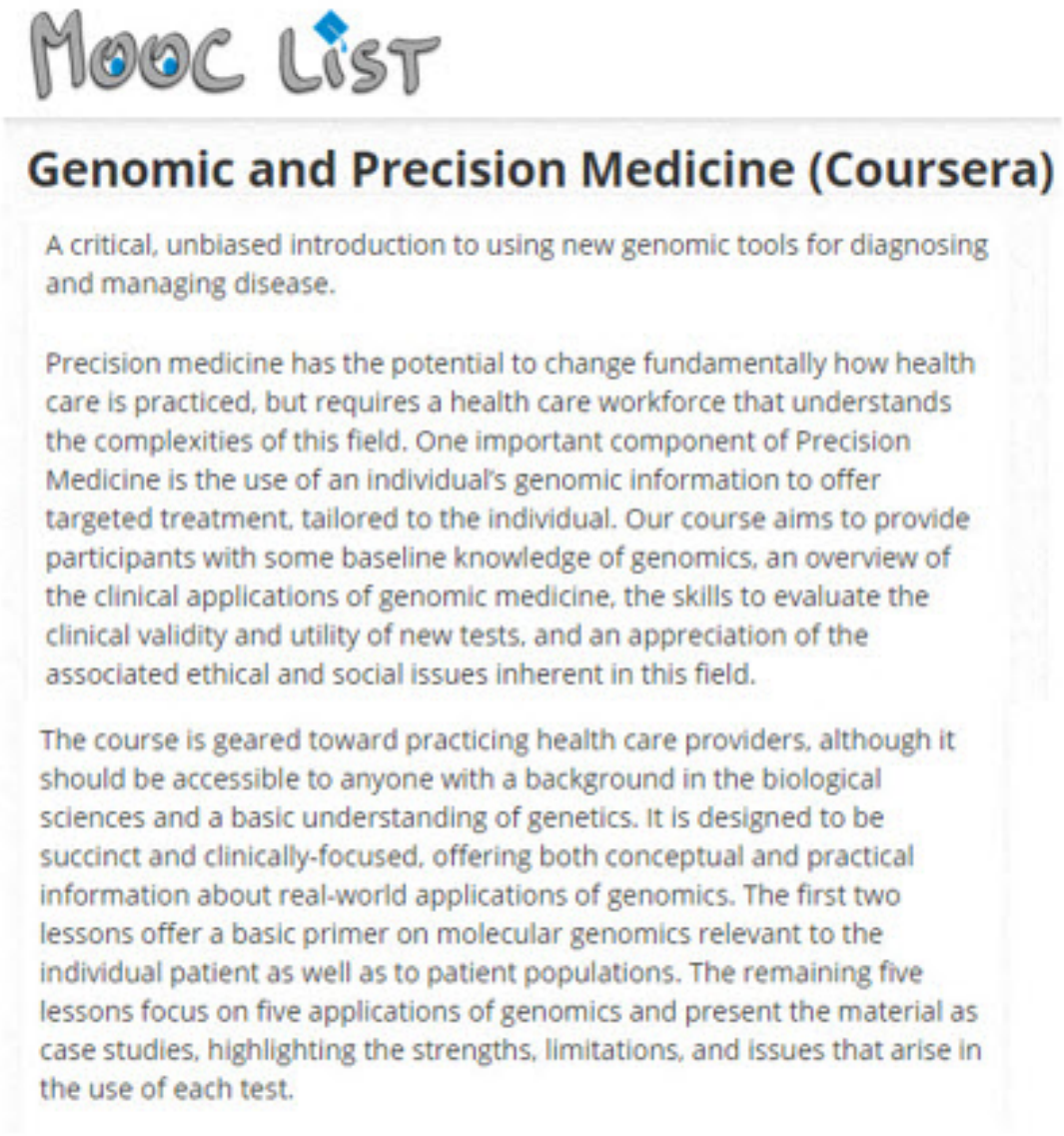
Participant 7. Understanding Terrorism and the Terrorist Threat

https://www.coursera.org/learn/understandingterror



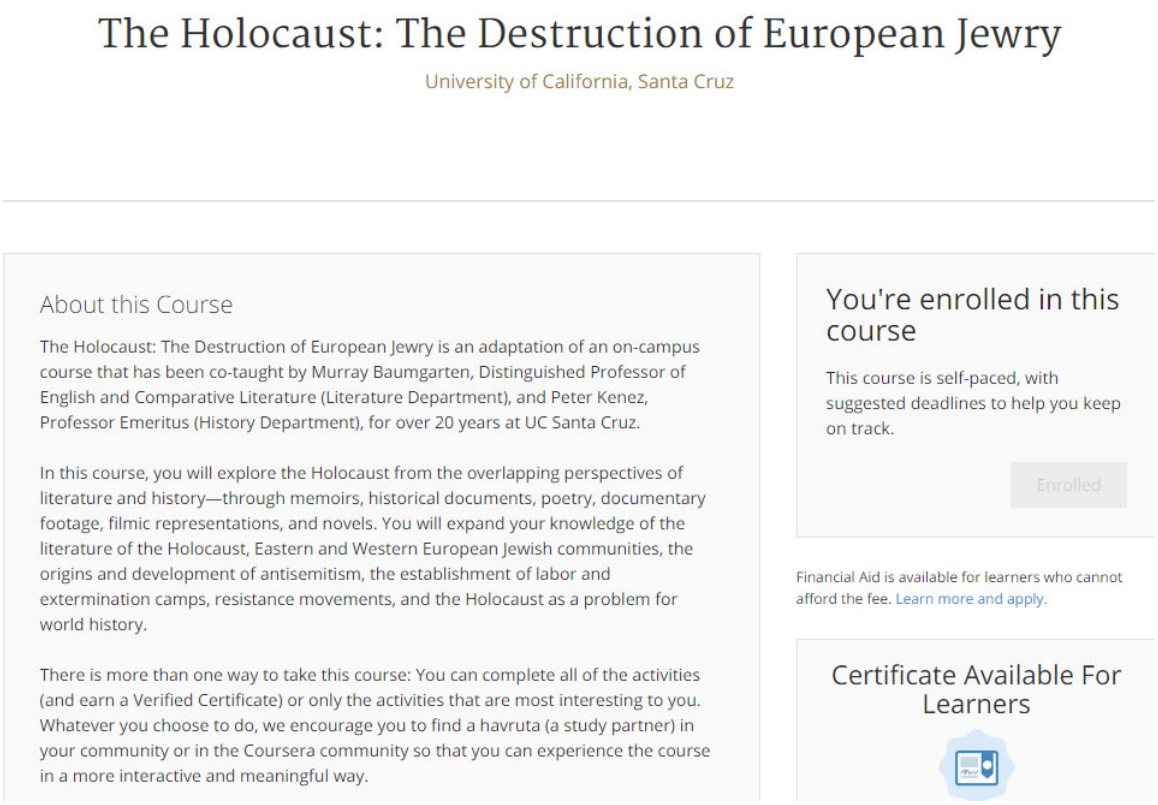
Participant 8. Genomic and Precision Medicine

https://www.mooc-list.com/course/genomic-and-precision-medicine-coursera?static=true



Participant 9. The Holocaust: The Destruction of European Jewry

https://www.coursera.org/learn/the-holocaust



Participant 10. Curanderismo Part 1: Traditional Healing of the Body

https://www.mooc-list.com/course/curanderismo-part-1-traditional-healing-body-coursera?static=true

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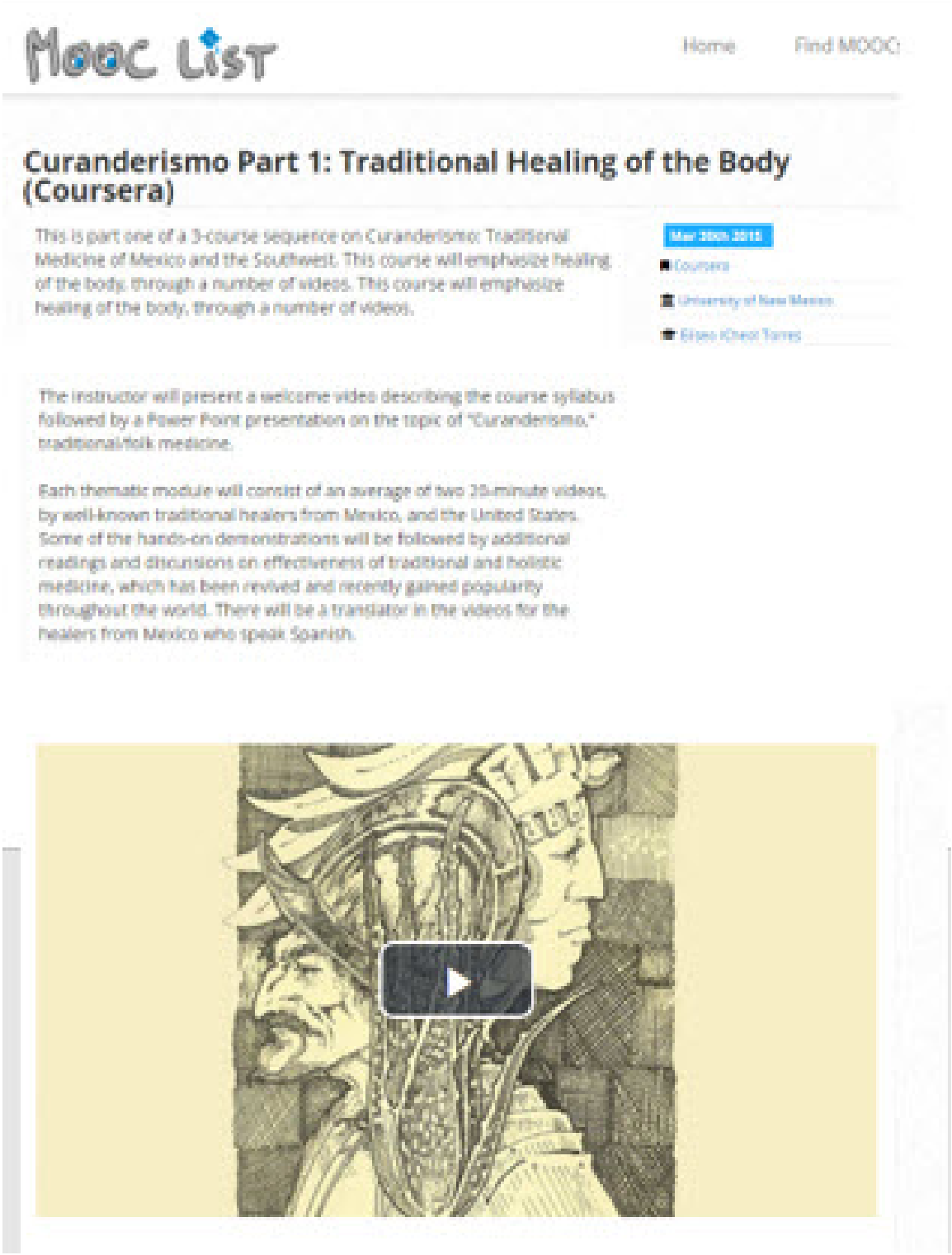

Participant 11. Introduction to Cataract Surgery

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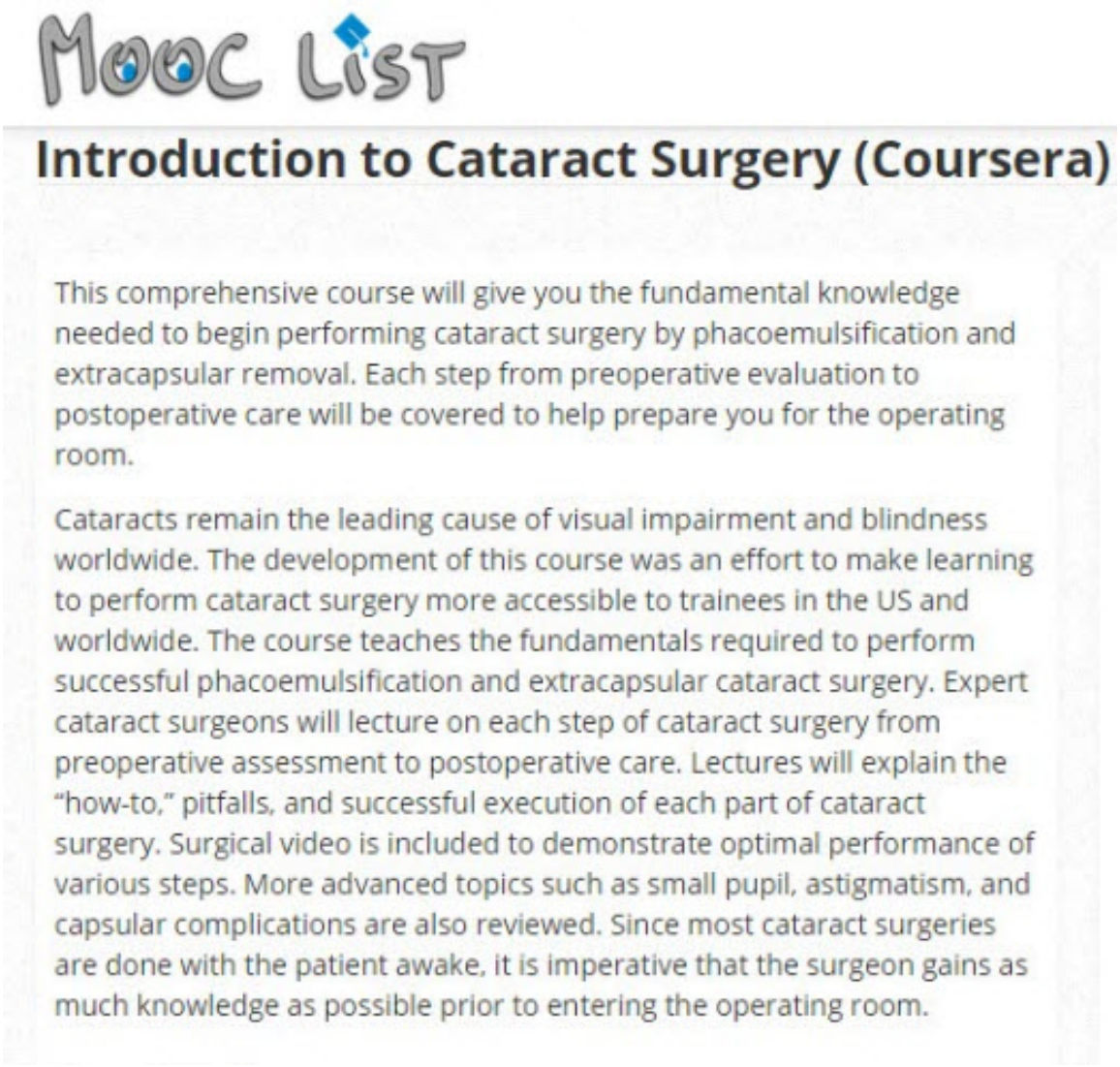


Participant 12. Powerful Tools for Teaching and Learning: Digital Storytelling

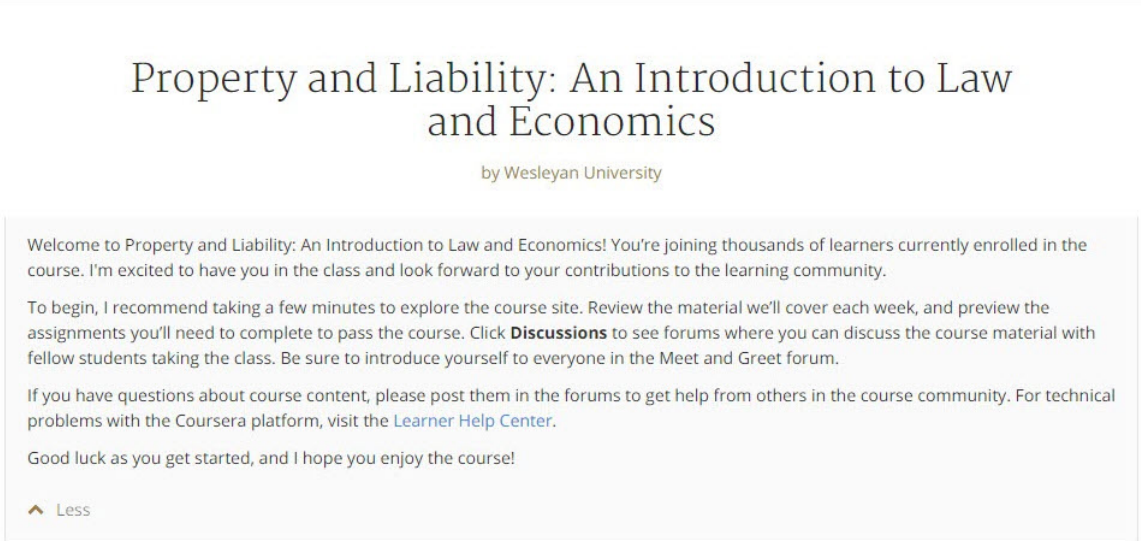
https://www.coursera.org/learn/digital-storytelling

Participant 13. Rural Health Nursing

https://www.mooc-list.com/course/rural-health-nursing-coursera?static=true

Participant 14. Property and Liability: An Introduction to Law and Economics

https://www.coursera.org/learn/property-law-and-economics



Property and Liability: An Introduction to Law and Economics

by Wesleyan University

Welcome to Property and Liability: An Introduction to Law and Economics! You're joining thousands of learners currently enrolled in the course. I'm excited to have you in the class and look forward to your contributions to the learning community.

To begin, I recommend taking a few minutes to explore the course site. Review the material we'll cover each week, and preview the assignments you'll need to complete to pass the course. Click **Discussions** to see forums where you can discuss the course material with fellow students taking the class. Be sure to introduce yourself to everyone in the Meet and Greet forum.

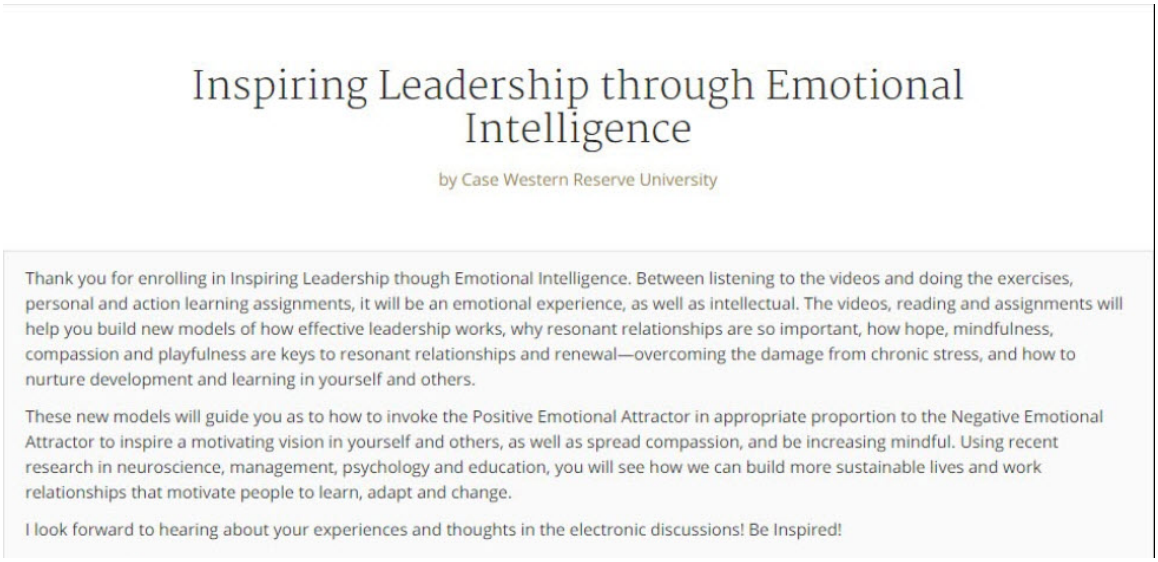
If you have questions about course content, please post them in the forums to get help from others in the course community. For technical problems with the Coursera platform, visit the Learner Help Center.

Good luck as you get started, and I hope you enjoy the course!

Less

Participant 15. Inspiring Leadership through Emotional Intelligence

https://www.coursera.org/learn/emotional-intelligence-leadership



Inspiring Leadership through Emotional Intelligence

by Case Western Reserve University

Thank you for enrolling in Inspiring Leadership though Emotional Intelligence. Between listening to the videos and doing the exercises, personal and action learning assignments, it will be an emotional experience, as well as intellectual. The videos, reading and assignments will help you build new models of how effective leadership works, why resonant relationships are so important, how hope, mindfulness, compassion and playfulness are keys to resonant relationships and renewal—overcoming the damage from chronic stress, and how to nurture development and learning in yourself and others.

These new models will guide you as to how to invoke the Positive Emotional Attractor in appropriate proportion to the Negative Emotional Attractor to inspire a motivating vision in yourself and others, as well as spread compassion, and be increasing mindful. Using recent research in neuroscience, management, psychology and education, you will see how we can build more sustainable lives and work relationships that motivate people to learn, adapt and change.

I look forward to hearing about your experiences and thoughts in the electronic discussions! Be Inspired!

UNIVERSITY of HOUSTON

DIVISION OF RESEARCH

June 17, 2015

Trang Phan
Dr. Sara G. McNeil
Curriculum and Instruction

Dear Trang Phan,

Based upon your request for exempt status, an administrative review of your research proposal entitled "Pedagogical Challenges in Addressing Multicultural Population Needs in Massive Open Online Course (MOOC) Design" was conducted on April 15, 2015.

At that time, your request for exemption under **Category 2** was approved pending modification of your proposed procedures/documents.

The changes you have made adequately respond to the identified contingencies. As long as you continue using procedures described in this project, you do not have to reapply for review. * Any modification of this approved protocol will require review and further approval. Please contact me to ascertain the appropriate mechanism.

If you have any questions, please contact Alicia Vargas at (713) 743-9215.

Sincerely yours,

Kirstin Rochford, MPH, CIP, CPIA
Director, Research Compliance

*Approvals for exempt protocols will be valid for 5 years beyond the approval date. Approval for this project will expire **June 16, 2020**. If the project is completed prior to this date, a final report should be filed to close the protocol. If the project will continue after this date, you will need to reapply for approval if you wish to avoid an interruption of your data collection.

Protocol Number: 15385-EX

UNIVERSITY of HOUSTON
A CARNEGIE-DESIGNATED TIER ONE PUBLIC RESEARCH UNIVERSITY

UNIVERSITY OF HOUSTON
CONSENT TO PARTICIPATE IN RESEARCH

PROJECT TITLE: Pedagogical Challenges in Addressing Multicultural Population Needs in Massive Open Online Course (MOOC) Design

You are being invited to take part in a research project conducted by Erwin Handoko and Trang from the department of Curriculum and Instruction at the University of Houston. The project is being conducted under the supervision Dr. Sara McNeil.

NON-PARTICIPATION STATEMENT

Taking part in the research project is voluntary and you may refuse to take part or withdraw at any time without penalty or loss of benefits to which you are otherwise entitled. You may also refuse to answer any research-related questions that make you uncomfortable.

PURPOSE OF THE STUDY

The purpose of the study is to identify how issues related to multicultural population are being addressed in Massive Open Online Course (MOOC) designs & development. The research will provide insights about challenges to that need to be addressed to improve the learning quality of global audience. The duration of the entire study is approximately 18 months.

PROCEDURES

You will be one of approximately 15 subjects invited to take part in this project.

The research project will look into pedagogical challenges faced in designing and developing a MOOC. Such information is only available from subjects who have the experience of designing, developing, and offering a course.

If we do not receive any response, a follow-up invitation email will be sent two week later. Following your approval, interview dates will be scheduled and interview modes (in-person, phone call, Skype call, or Google Hangout call) will be decided. The interview is planned to be less than an 45-60 minutes, during which we will ask a list of questions related to your experience designing and developing a MOOC.

CONFIDENTIALITY

Every effort will be made to maintain the confidentiality of your participation in this project. Each subject's name will be paired with a code number by the principal investigator. This code number will appear on all written materials. The list pairing the subject's name to the assigned code number will be kept separate from all research materials and will be available only to the principal investigator. Confidentiality will be maintained within legal limits.

RISKS/DISCOMFORTS

As far as we concern, there is no foreseeable risk for your participation in this research.

BENEFITS

While you will not directly benefit from participation, your participation may help investigators better understand about challenges that need to be addressed to improve the learning quality of instruction for global audience.

ALTERNATIVES

Participation in this project is voluntary and the only alternative to this project is non-participation.

PUBLICATION STATEMENT

The results of this study may be published in scientific journals, professional publications, or educational presentations; however, no individual subject will be identified.

AGREEMENT FOR THE USE OF AUDIO TAPES

If you consent to take part in this study, please indicate whether you agree to be audio taped during the study by checking the appropriate box below. If you agree, please also indicate whether the audio tapes can be used for publication/presentations.

- ☐ I agree to be audio taped during the interview.
  - ☐ I agree that the audio tape(s) can be used in publication/presentations.
  - ☐ I do not agree that the audio tape(s) can be used in publication/presentations.
- ☐ I do not agree to be audio taped during the interview.

Note: Even if you disagree to audiotaping, you can still take part in the research.

SUBJECT RIGHTS

1. I understand that informed consent is required of all persons participating in this project.

2. I have been told that I may refuse to participate or to stop my participation in this project at any time before or during the project. I may also refuse to answer any question.

3. Any risks and/or discomforts have been explained to me, as have any potential benefits.

4. I understand the protections in place to safeguard any personally identifiable information related to my participation.

5. I understand that, if I have any questions, I may contact Erwin Handoko at (832) 812- 2147, email at ehandoko@uh.edu or Trang Phan at (956) 445-9275, email at tphan2@uh.edu. I may also contact Dr. Sara McNeil, faculty sponsor, at (713) 743-4975

or email at smcneil@uh.edu.

6. **Any questions regarding my rights as a research subject may be addressed to the University of Houston Committee for the Protection of Human Subjects (713-743-9204). All research projects that are carried out by Investigators at the University of Houston are governed be requirements of the University and the federal government**.

SIGNATURES

I have read (or have had read to me) the contents of this consent form and have been encouraged to ask questions. I have received answers to my questions to my satisfaction. I give my consent to participate in this study, and have been provided with a copy of this form for my records and in case I have questions as the research progresses.

Study Subject (print name): _____

Signature of Study Subject: _____

Date: _____

I have read this form to the subject and/or the subject has read this form. An explanation of the research was provided and questions from the subject were solicited and answered to the subject's satisfaction. In my judgment, the subject has demonstrated comprehension of the information.

Principal Investigator (print name and title):_____

Signature of Principal Investigator: _____

Date: _____