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CROSS-CULTURAL MOOCs:

DESIGNING MOOCs FOR CHINESE STUDENTS

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ABSTRACT

Advocates of Massive Open Online Courses (MOOCs), a cross-cultural phenomenon that has attracted public attention throughout the world, portray them as an equalizing force in international higher education; but researchers have noted discrepancies in how learners from different countries have engaged with them. The number of MOOC learners in China is growing rapidly, and Chinese learners are enthusiastic about the unprecedented freedom they now have in selecting courses and accessing resources from the best international universities. However, they have a significantly low completion rate and may experience unique challenges about which little is known. This study took into account the diversity of MOOC learners and proposed changes to its course design to make it more inclusive for Chinese students. I used a mixed method—including document analysis, surveys, and interviews—to investigate the Chinese experience of taking Western MOOCs and also to explore the

educational theories and design principles of MOOCs that have been discussed in the Western and Chinese literature. My analysis of the literature revealed issues of contextualization that may play a critical role in improving the MOOC experience for Chinese students. Drawing on theoretical educational frameworks—including motivation, community of inquiry, self-regulated learning, and social identity—my analysis of surveys and interviews identified common themes in the Chinese experience of Western MOOCs. In accordance with the results of my analysis, and also in line with interaction equivalency and situational principles, this study provided suggestions for adapting MOOCs to Chinese learners, such as enhancing content quality, improving learner–learner and learner–instructor interactions, providing social support, and collaborating with local universities and agencies in providing technical and credentialing support.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1: Introduction

Statement of the Problem

Over the past two decades, rapid developments in information technology have enabled online education to increase significantly in accessibility and popularity in higher educational institutions. Massive Open Online Courses (MOOCs) began to attract major public attention in 2011 when Stanford University observed that more than 100,000 students had enrolled in freely available online versions of two of their artificial intelligence courses. According to a Class Central report entitled "By the Numbers, MOOCs in 2017," over 800 universities around the world have launched at least one MOOC; the total number of such courses that have been announced stands at 9,400; and they have around 81 million enrollees as of 2017 (Shah, 2018).

With the increasing number of MOOCs and participants, a huge volume of news reports and articles on the subject have appeared in the popular and educational press, including stories on successes, challenges, and related economic issues. A great deal of public attention has been paid to MOOCs' potential to significantly affect the existing higher education system (Gašević, Kovanović, Joksimović, & Siemens, 2014; Pappano, 2012). The evidence-based research literature on the topic is also growing rapidly (Veletsianos &

Shepherdson, 2016). The range of evolving research areas is broad and covers educational theory and pedagogies, technology and platforms, learner experiences, instructional design, context and impact, and so on.

Advocates for MOOCs have portrayed them as an excellent equalizer for higher education. However, in recent years, researchers have noticed discrepancies in how learners from different countries have engaged with them (Kizilcec, Saltarelli, Reich, & Cohen, 2017). In particular, those from poor socioeconomic backgrounds and less developed countries are less likely to enroll in or complete courses (Kizilcec et al., 2017). Kizilcec et al. (2017) proposed that the achievement gap between geographic locations may be the result of MOOCs tending to be based in North American schools and presented in English, giving them an inherent Western-culture bias.

Very little is known about the actual MOOC learning experience of students from non-Western countries. Evidence-based research studies investigating MOOCs have mainly been conducted in Western countries, including in North America and Europe (Zhu, Sari, & Lee, 2018). Veletsianos and Shepherdson (2016) indicated that research into MOOCs arising predominantly from Western countries has largely been focused on learners who understand the language, have access to internet technologies, and identify with

Western learning cultures. If research from select geographic regions dominates the direction and focus of MOOC-related studies, the improvement of our empirical understanding of them might be limited in scope (Veletsianos & Shepherdson, 2016). In addition, literature reviews of MOOCs in published studies have usually been limited to those publications written in English, meaning that studies written in other languages, such as Chinese, Spanish, German, and Korean, are not usually included. The likelihood is that some valuable MOOC studies from diverse cultures have been overlooked by Western researchers.

China has the fastest-growing number of MOOC users. Students from that country are enthusiastic about the unprecedented freedom to select courses and access the best educational offerings from the best universities in the world. However, as in other non-Western countries, learners in China also have a significantly low completion rate and may experience unique barriers and challenges of which we know very little.

To comprehend the MOOC phenomenon through a more diverse perspective and to make its design more inclusive to learners from different cultures, we must investigate the experience of MOOC learners in China and explore the suggestions of relevant studies in the Chinese literature.

Research Purpose

The purpose of this study was to investigate Chinese students' experience of taking Western MOOCs, as well as to explore the educational theories and design principles of MOOCs that have been noted in Western and Chinese literature. The analysis of the literature revealed contextualization considerations that may play a critical role in improving the MOOC learning experience for Chinese students. Additionally, through the lens of educational theoretical frameworks, such as motivation, community of inquiry, self-regulated learning, and social identity, the analysis of the surveys and interviews has resulted in the identification of common themes among Chinese students' experience of taking Western MOOCs.

The findings of this study have improved the understanding of Chinese students' experiences of a Western MOOC-based environment and yielded suggestions for how to improve the design of MOOCs for a Chinese audience.

Research Questions

The author of this study used a mixed method, including document analysis, surveys, and in-depth interviews, to answer the following research questions:

- RQ1: What educational theories and design principles are guiding the design of Western MOOCs?
- RQ2: What educational theories and design principles are guiding the design of MOOCs in China?
- RQ3: What are the differences and similarities between the educational theories and design principles that are guiding the design of MOOCs in China and Western countries?
- RQ4: What are the learning experiences of Chinese students while taking Western MOOCs?
- RQ5: To accommodate socio-cultural differences in learning, how should Western instructional designers design MOOCs for Chinese students?

Researcher's Interest

My long-term passion for education and technology has shaped both my academic and professional life. I grew up in China before moving to the United States for graduate school. Over the past decade, I have been working in the IT industry, designing and developing technical solutions and training programs for customers worldwide.

As a result of my personal cross-cultural learning experience, I have always been interested in how social and cultural contexts affect learning. I still

vividly remember the challenges in a Western classroom that faced me as a new international student who came from a completely different learning culture. Additionally, I observed first-hand evidence that educational interventions or innovations may not always work equally as well for learners from different countries and cultures. For example, some online training programs that we created at work were highly successful in the United States; however, when we translated them into other languages and launched the exact same program in other nations, the results were not always satisfactory. Much of the evidence also showed that the comfort level with e-learning's interactive and collaborative style across countries and cultures may evolve rapidly in the coming years. For example, my nieces and nephews from China currently play games online with kids from all around the world. I have always been fascinated by how technology has changed education and collaboration and have given much thought to whether the global nature of MOOCs will amplify or reduce the social and cultural differences, especially for the younger generation.

This study was informed by my personal belief that we must have a much better understanding of how students from diverse cultural backgrounds learn through MOOCs before we can adequately address the needs of these students around the world. An urgent need exists for us, as researchers, to dig more

deeply into the richness of diverse cultural groups' experiences in the MOOC environment.

Chapter 2: Literature Review

In this chapter, the relevant research and conceptual frameworks are examined to understand the evolution of MOOCs and the gaps in the literature and to outline the theoretical constructs that serve as a foundation from which to analyze the study participants' experiences and provide design implications. The chapter will begin with a description of online education, MOOCs, their development in the United States and China, and relevant research. It will then feature a review of the existing literature on the theoretical concepts of motivation, social presence, community of inquiry, self-regulated learning, interaction equivalency, and situational principles that are most germane to an understanding of this group of Chinese students' experiences and the design considerations for MOOCs.

Online Education and MOOCs

Online Education

Online education (OE) has its roots in distance education (DE), which itself has a long history dating back to the correspondence schools of the 19th century (Moore & Kearsley, 2005). With the advancement of technologies in the 20th century, distance education has grown significantly through the use of radio and television, the establishment of open universities, teleconferencing, and

eventually the advent of internet/web-based online education (Moore & Kearsley, 2005).

Before the arrival of MOOCs, a large body of literature explored many facets of online education (Ally, 2008; Cole, 2000; Rovai, 2002; Taylor, 2001; Walsh et al., 2011). Online education is one of the most influential forms of distance learning due to its unique ability to challenge longstanding barriers (Maull, Saldivar, & Sumner, 2010). Some have claimed that online learning has provoked a "transformative revolution" and played a significant role in reshaping the landscape of education as we know it today (Baggaley, 2013; Bonvillian & Singer, 2013; Cusumano, 2013). Unlike correspondence education or other versions of DE, online education has made a significant impact on the mainstream educational industry (Allen & Seaman, 2013). Allen and Seaman (2015) claimed that, from 2002 to 2014 alone, the percentage of academic leaders that reported online learning as being "critical" to their long-term strategy rose from 48.8% to 70.8%. However, OE has continued to suffer from many of the longstanding criticisms of DE. For example, some have contended that online learning environments cannot replicate key elements of traditional education such as personal interaction or authentic communities of learning (Robertson, 1998). However, additional resources such as video chat capability, real-time

messaging boards, and interactive lesson interfaces have begun to undermine longstanding criticisms about online and distance learning environments (Fini, 2009; Garrison & Archer, 2000). Online courses and integrated learning management systems (LMS), such as iLearn or Blackboard, have become common facets of most higher education institutions in the United States (Fini, 2009; Kop, 2011). Many efforts have aimed to develop best practice and approaches to improve online learning since the rapid development in online education has ignited the interest of researchers and practitioners alike (Artino, 2008; Palloff & Pratt, 2000; Ragan et al., 2012).

MOOCs

The term MOOC (massive open online course) was coined in 2008 by David Cormier of the University of Prince Edward Island to describe an experimental course called "Connectivism and Connective Knowledge" or CCK08. This course was taught both in person and online by George Siemens and Stephen Downes at the University of Manitoba. The course was delivered to 25 for-credit students as well as more than 2,300 online learners all over the world at no cost. All content was accessible through RSS feeds. CCK08 is generally considered to be the first MOOC. This model of MOOC emphasizes the connection and interaction among students. This branch of MOOCs was

later referred to as connectivist MOOCs (cMOOCs). Early MOOCs were "experimental, non-linear, and deeply dialogic and participatory" (Stewart, 2013, p. 230).

Since MOOC is such a fast-evolving phenomenon, the MOOC definition is vague and changing constantly. The Oxford Dictionary defines a MOOC as "a course of study made available over the Internet without charge to a very large number of people." Marques and McGuire (2013) proposed a more updated definition: a MOOC is an educational resource similar to a class which has assessment mechanisms and an endpoint, which is all online and free to access without admissions criteria, and which involves hundreds of students or more.

MOOCs have three major common characteristics: massive, open, and online. MOOCs are "massive" in that they are designed to host many thousands of students in a given course, "open" in that they are most often freely available to anyone with internet access, and "online" in that they leverage internet technologies to enable participation by people who may be dispersed throughout the world. Some researchers believe that the original definition of MOOCs will change as a result of various challenges and rapid developments in this field (Yousef & Chatti, 2014). For example, scalability issues and low completion rates (less than 10% in most of the offered MOOCs) constantly concern MOOC

providers (Brown, 2013; Uvalić-Trumbić & Daniel, 2013). Moreover, several MOOC providers either charge fees for their courses or offer courses for free, but learners must pay for exams, certificates, or teaching assistance from third-party partners (Brown, 2013).

Though usually mentioned as one general term, MOOCs have actually branched into two major types, referred to as cMOOCs and xMOOCs (Daniel, 2012; Rodriguez, 2012). cMOOCs were created based on connectivism learning theory. xMOOCs were based on the behaviorism and cognitivism theories with some (social) constructivism components that focus on learning-by-doing (i.e., experimental, project-based, or task-based) activities.

cMOOCs, also called connectivist MOOCs, trace their history directly to the first MOOC, CCK08, which used widely available open online tools and connectivist teaching and learning methods (Fini, 2009). This type of MOOC put the emphasis on connectedness, self-organization, and learning through community building (Kassabian, 2014). cMOOCs tend to have more informal course infrastructure, and they generally have a lower number of participants, in the hundreds or low thousands (Kassabian, 2014). They provide space for self-organized learning, where learners can define their own objectives, present their own view, and collaboratively create and share knowledge. cMOOCs empower

learners to build their own networks via blogs, wikis, Google groups, Twitter, Facebook, and other social networking tools outside the learning platform without any restrictions from the teacher (Kruiderink, 2013). Moreover, peer assessment has been used to grade assignments or tests based on predefined rubrics that improve students' understanding of the content. Thus, cMOOCs are distributed in networked learning environments where learners are at the center of the learning process.

xMOOCs are also called institutional MOOCs or AI MOOCs (Rodriguez, 2012; Siemens, 2012). The Stanford AI courses popularized this model of MOOC. xMOOCs tend to rely on a dedicated learning management system. They have a formal structure and clearer roles defined in terms of learner, teacher/facilitator and sometimes teaching assistant. Therefore, this MOOC model bears more similarity to a large-scale class (Kassabian, 2014). The number of enrollments in xMOOCs have been growing rapidly around the world. In xMOOCs, teachers predefine learning objectives and impart their knowledge through short video lectures, often followed by simple e-assessment tasks (e.g., quiz, eTest) (Daniel, 2012; Kruiderink, 2013; Stewart, 2013). Only a few xMOOCs have used peer assessment. Moreover, this type of MOOC provides limited communication space between the course participants (Gaebel, 2013). Unlike cMOOCs, the

communication in xMOOCs happens within the platform itself.

In addition to cMOOCs and xMOOCs, new forms of MOOCs have emerged in recent years. These include smOOCs, small open online courses with a relatively small number of participants (e.g., COER13), and blended MOOCs (bMOOCs), hybrid MOOCs including in-class and online mediated instruction (e.g., OPCO11) with flexible ways that learners can interact in real time that fit their motivation and build learner commitment to the courses (Coates, 2013; Daniel, 2012; Gaebel, 2013).

The Evolution of MOOCs in the United States

Early in the 21st century, major U.S. universities launched several precursors to today's MOOCs. Among some famous efforts were Fathom (led by Columbia University), AllLearn (a partnership among Oxford, Princeton, Stanford, and Yale), MIT OpenCourseWare, and the CMU Open Learning Initiative. Fathom converted a small number of well-received Columbia courses into online courses and delivered these courses to paying students. Fathom was sponsored partly through earnings from Columbia University patent royalties, and any revenue surplus from Fathom was directed back to Columbia University (Walsh et al., 2011). Similar to Fathom, AllLearn offered full course instruction in a web-enabled format. AllLearn was a small consortium of elite universities, and

it was a not-for-profit organization, designed to simply cover costs (Walsh et al., 2011). However, both Fathom and AllLearn had too few paying customers, and both efforts had to be shut down in early 2000 (Kassabian, 2014).

Unlike Fathom and AllLearn, both MIT's OpenCourseWare and CMU's Open Learning Initiative chose not to charge for access. MIT's OpenCourseWare distributes free course materials, such as syllabi, course notes, and assignments, but instructor guidance or facilitation was not provided as part of the service. CMU's Open Learning Initiative (OLI) developed course content for a limited number of CMU courses tailored for web delivery and student interaction. Both MIT's OpenCourseWare and CMU's Open Learning Initiative continue to exert an impact on the evolving open online learning industry today.

Of the four efforts described here, CMU's OLI is perhaps the most closely comparable to today's MOOCs since OLI provides course instruction, rather than content only, and is designed for the web and offered at no charge (Kassabian, 2014). However, OLI focuses more on interaction and leverages feedback loops built directly into the courses to try to better address diverse learning needs (Walsh et al., 2011). OLI is most effective when students use the course to prepare for class so that instructors can use precious class time more effectively.

The most popular MOOC content in the United States is usually from a

group of mostly elite universities and celebrity faculty. Some researchers claim that the growth of MOOCs marks a major change in the public perception of online education from "down-market for-profit colleges to the most famous universities in the world" (Carey, 2012).

EdX, Udacity, and Coursera are three primary MOOC platforms that are partnering with elite universities and their faculty. All three platforms were established in early 2012. EdX is a not-for-profit association of member universities started by an MIT faculty member, later joined by Harvard in May 2012 (Waldrop, 2013). Udacity and Coursera are commercial, for-profit platforms started by Stanford faculty members. Sebastian Thrun announced Udacity in January 2012, and Daphne Koller and Andrew Ng announced Coursera in April 2012. Both edX and Coursera have members from top universities, while Udacity works directly with faculty members rather than with member universities. Each of these platforms offers an established consistent online course format and provides server infrastructure that supports a massive number of students. Alternative MOOC platforms that are based on traditional learning management systems from big players in the industry such as Blackboard or Instructure are also available. In addition, Google and edX created MOOC.org, designed to make an open-source version of the edX

platform broadly available, including to those faculty members who are not at universities that have signed with Coursera or edX (Fox, 2013).

Current MOOC platforms have learned and improved from the lessons of their predecessors and have evolved significantly since their early years. According to Shah (2018), MOOCs may finally have found a sustainable revenue model over half a decade since their debut. Class Central has identified six different tiers of the MOOCs' monetization model: free or free to audit, certificate, micro-credential, university credit, online degrees, and corporate training (Shah, 2018). Essentially, the same course that is free of charge and anyone can register for, is being monetized at different pricing levels, with the free product acting as a marketing channel that feeds customers into other higher priced products (Shah, 2018).

The advances in information technology are also helping modern MOOCs to evolve quickly. It is now easier and more cost-effective to produce high-quality educational content for the web than a decade ago. Internet access has become ubiquitous, and advanced, always-connected mobile devices with multimedia capabilities have proliferated. Online courses are now available to anyone with a smartphone, a laptop, or a tablet computer. More importantly, thanks in large part to TED Talks and Khan Academy, a young generation of

learners is expecting to learn online. Anant Agarwal (2013), the edX president, expressed the belief that a generation of students is now growing up surrounded by internet technology for communication and information retrieval, and that it makes good sense to recognize and leverage this fact when designing courses for them.

The Evolution of MOOCs in China

MOOCs are no longer a North American phenomenon. Since Stanford University decided to offer several reputable courses online for free in 2011, MOOCs have expanded to engage learners around the world. The momentum is far greater than has been reported, and a multitude of overseas learners have been enrolling in a MOOC at a preferred North American institution (Universities UK, 2013). Institutions in at least 50 countries offer MOOCs (MOOC List, 2014), most commonly in partnership with a MOOC provider, such as Coursera or edX. While 2012 was deemed the first year of the era of MOOCs in the United States, 2013 was considered the first year of the era of MOOCs in China. In 2013, many top universities in China joined the major MOOC platforms such as edX and Coursera. For example, in May 2013, Peking University, Tsinghua University, Hongkang University, and Hongkang University of Technology became partners of edX. In July 2013, Fudan

University and Shanghai Jiaotong University signed partnership contracts with Coursera. In the meantime, Tsinghua University created its own MOOC platform, called XuetangX, based on OpenEdx. Many MOOC platforms have also been created in China. The global appeal for institutions to design MOOCs domestically suggests a desire on the part of learners for greater contextualization (e.g., curriculum, language, culture) that the more popular MOOCs in North America do not provide.

Table 2.1 illustrates the current MOOC platforms in China.

Table 2.1

MOOC Platforms in China

Name	Web Address	Course type	Language	Provider
China University MOOC	http://www.icourse163.org/	Higher education	Chinese	Icourse and NetEase Yunketang
XuetangX	http://www.xuetangx.com	Higher education	Chinese	Tsinghua University
CN MOOC	http://www.cnmooc.org	Higher education	Chinese	Shanghai Jiaotong University
ewant	http://www.ewant.org	Higher education	Chinese	Five Jiaotong universities in mainland China and Taiwan
Icourses	http://www.icourses.cn/home/	Higher education	Chinese	China education sector and finance sector
Shanghai Course	www.ucc.sh.edu.cn	Higher education	Chinese	Shanghai city government and

Center (Wisdom Tree)				education department
IMOOC	http://www.imooc.com	IT technology (focusing on Web and PHP development)	Chinese	Beijing MOOC Technology Center
JIKE Institute	http://www.jikexueyuan.com	Software development (including HTML5, Android development, Cocos2dx gaming development and IOS development)	Chinese	Beijing Yilianzhiyuan technology company

The irreversible momentum of MOOCs is penetrating all levels of the education system in China. Students are equipped with unprecedented freedom to select courses and access the best educational offerings at home and abroad. MOOCs are the driving force behind motivating the Chinese education system to move. Tang Min (2015), a counselor at the Counsellors' Office of the State Council in China, asserted that inequality of education is the one of biggest issues in China, and MOOCs have enormous potential to make a fundamental impact on the education reform in China. In April 2015, the Ministry of Education of the People's Republic of China published an official document called *Opinions About Strengthening the Development and Administration of Open Online Courses for Higher Education*. In this official document, the Ministry of

Education emphasized that MOOCs have brought higher education and basic education unprecedented challenges and opportunities and have encouraged higher educational institutions in China to participate in MOOCs. Mainland China has 2,742 universities, among which 131 are considered top universities. The resource gap between the top universities and common universities is significant. The Chinese government and the Ministry of Education are in the process of accelerating research on the impact of MOOCs on the country's entire education system and providing guidance and support for the development of MOOCs in China (Ministry of Education in China, 2015).

MOOC Research

A wide range of research topics concerning MOOCs have rapidly come into existence in recent years. Various investigators have attempted to analyze the MOOC literature, including Ebben and Murphy (2014), Hew and Cheung (2014), Jacoby (2014), Kennedy (2014), Liyanagunawardena, Adams, and Williams (2013), Veletsianos and Shepherdson (2016), Yousef et al. (2014), and Zhu, Sari, and Lee (2018). These reviews have been focused on diverse aspects of the literature. For example, Hew and Cheung (2014) examined students' and instructors' perspectives, while Jacoby (2014) focused on the evidence supporting the role of MOOCs as a disruptive force. Despite this broad array of individual

reports, several themes have emerged across some or all of the reviews. The following paragraphs constitute a summary of the major research angles regarding MOOCs and an identification of the gaps in the current literature. The main themes discussed below include: concepts and impact; theories and design; and participants' demographics and experience.

Concepts, impact, and evolution. The early literature covers a great deal of ground in terms of MOOC-related concepts, including their definition, their evolving history, and the various types. The researchers noted distinctions between cMOOCs and xMOOCs. Most of those in the reviewed literature focused more heavily on the latter as a new model of learning and teaching in higher education (Milligan et al., 2013; Rodriguez, 2012).

Much of the research on MOOCs has taken the form of an analysis of MOOCs' potential impact on education. Jacoby (2014) focused specifically on their disruptive capabilities. For example, the author identified characteristics of certain MOOCs, such as their size, automation in grading, and openness, particularly with regard to cMOOCs, as factors that may possibly affect approaches to teaching and learning. Kennedy (2014) also highlighted the size and openness of MOOCs in terms of their capacity to disrupt "conventional thinking about the role, value, and cost of higher education" (p. 9). Ebben and

Murphy (2014) discussed semantic shifts in the discourse around MOOCs (e.g., referring to students as participants) and suggested that these could imply a reduction in the authority and importance of the educational leader—who would now be an instructor or facilitator rather than a professor. On an institutional level, Jacoby (2014) described the impact that the rise of MOOCs may have on universities' business models. Furthermore, the author discussed the potential for new entrants to the higher education market to provide a product that is a suitable substitute for existing models of educational delivery, while also suggesting that the collaboration of traditional institutions in creating and distributing MOOCs may undermine this substitution.

Clearly, MOOCs have not disrupted higher education up to this point (Shah, 2018). Most universities have abandoned cMOOCs because they are difficult to manage and organize, and difficulties are involved in granting certification for students based on informal learning (García-Peñalvo, Fidalgo-Blanco, & Sein-Echaluce, 2017). Meanwhile, although xMOOCs have been widely adopted, they have not been disruptive because they are nothing more than an extension of the current mode of online courses in the universities to a new context, and thus they miss the chance for formative evolution (García-Peñalvo et al., 2017). Efforts have already been made to develop MOOCs that

integrate the disruptive elements of cMOOCs with the advantages of xMOOCs; these include hybrid MOOCs (hMOOC) (Fidalgo-Blanco et al., 2016). These hybrid courses combine xMOOC platforms with social networks, content-centric learning methodologies with activity-centric methodologies, and participants as knowledge recipients with participants as creators of knowledge (Fidalgo-Blanco et al., 2016).

Theories and design. Learning theories provide a foundation for the planning and designing of effective instructional activities. According to Kop et al. (2011), connectivism theory is the foundation for designing cMOOCs. The traditional behaviorism and cognitivism theories, along with some (social) constructivism components, have shaped the design of xMOOCs.

The reviewed studies on MOOCs design have featured appraisals of collaborative design activities, assessments, the learning community, digital badging, the quality of the design, how MOOCs are designed for professional development and attitude change, and so on. The researchers concerned have also distinguished between pedagogical and technological design principles. To encourage learners to complete the course, Vihavainen et al. (2012) proposed MOOCs that scaffold learners' tasks, using a purpose-built assessment solution and continuous reflection between the learner and the advisor. The integration

of social networks in MOOCs in other studies has added new value to learners' interactions and activities (Morris, 2013; Calter, 2013). Additionally, McAndrew (2013) created a project-based MOOC by structuring it around a course-related project. Bruff, Fisher, McEwen, & Smith (2013), for their part, focused on competency-based design, self-paced learning, and pre-definition of learning plans, as well as open network interaction and collaboration tools that increase motivation and prevent participants losing interest and dropping out from the course. The technology features in MOOCs can also support various important activities in the learning experience, such as interaction, collaboration, evaluation, and self-reflection (Fournier et al., 2011). The tools used in the literature can be classified into three main types; namely, collaboration, assessment, and analytics. MOOCs complicate the provision of personalized feedback and guidance to a massive number of learners. Several MOOC studies have involved attempted applications of learning analytics and intelligent adaptive tools to monitor the learning process, identify difficulties, discover learning patterns, provide feedback, and support learners in reflecting on their own learning experience (Giannakos et al., 2013; García-Peñalvo et al., 2017).

Learner demographics and experience. Most early literature on MOOCs took the form of institutional reports, which frequently described learner

enrollment and demographics (Gasevic, Kovanovic, Joksimovic, & Siemens, 2014). Ebben and Murphy (2014) described people from 194 countries who were enrolled in one MOOC, stating: "the vast majority were male, between the ages of 20 and 40, and had already earned a college degree or higher" (p. 338). The same authors also reviewed other research that indicated that more than half of learners in MOOCs are from countries other than the United States. In contrast, Liyanagunawardena et al. (2013) stated that in research containing demographic information, "a large majority of participants were from North America and Europe," with a small minority being from Asia, Southeast Asia, or Africa (p. 217). These authors suggested that this may be for technological and linguistic reasons.

In recent years, more than half of MOOC studies have concerned the participants or students (Zhu et al., 2018; Coffrin, Corrin, de Barba, & Kennedy, 2014). Authors of these student-focused studies have tended to focus on learners' behaviors, motivation, satisfaction, performance, interaction, engagement, and retention. New topics, such as communication patterns, the social structure of the discussion threads, and attitudinal change, are also emerging.

Researchers identified that low completion rate is one of the most significant challenges that must be overcome in studies involving MOOCs. Some researchers have suggested that completion rates in MOOCs are less than 10% (Ebben & Murphy, 2014). Said authors suggested that this may be because participation in MOOCs is free, leading users to participate in activities that are of interest to them without necessarily completing all the parts required to finish a course. However, Hew and Cheung (2014) were less positive about participants' reasons for non-completion, identifying the following list of reasons as pertinent:

> A lack of incentive, insufficient prior knowledge (e.g., lack of math skills), a lack of focus on the discussion forum (e.g., off-track posts), failure to understand the content and no one to turn to for help, ambiguous assignments and course expectations, and a lack of time due to having other priorities and commitments to fulfil. (p. 49)

Gaps in the literature. Two key gaps identified in the current literature are: lack of qualitative research and lack of cross-cultural studies (Veletsianos & Shepherdson, 2016; Zhu et al., 2018).

MOOC researchers have most frequently used quantitative research methods to gather and analyze their data (Zhu et al., 2018). Easy access to

MOOC datasets has led to quantitative research being favored over other methods (Veletsianos, Collier, & Schneider, 2015). Very few studies have been informed by methods traditionally associated with qualitative research approaches (e.g., interviews, observations, and focus groups). Despite research into MOOCs being focused on student-related topics, learners' voices were largely absent in the literature. Investigators have called for an urgent expansion of the methodological approaches used in MOOC research, because dependence on particular research methods may restrict our understanding of MOOCs (Veletsianos & Shepherdson, 2016; Zhu et al., 2018).

In addition, the majority of studies have been conducted by Western researchers, with a strong focus on a Western audience. As such, our empirical understanding of MOOCs might be limited by these types of perspectives (Veletsianos & Shepherdson, 2016). Researchers have suggested that the possible cultural differences of participants in MOOCs and their related experience would be an interesting avenue of research in relation to cultural tension in MOOCs (Liyanagunawardena et al., 2013). Cross-cultural research may help inform those in the field of how MOOC research paradigms, methods, and topics of interest differ in various regions of the world (Zhu et al., 2018). Furthermore, literature reviews of MOOCs in published studies have usually been limited to

those publications written in English, meaning that some valuable studies written in other languages may have been overlooked by Western researchers.

Learning Theories and Conceptual Frameworks

Connectivism

Learning using massive open online courses (MOOCs) has been influenced by theories that support using technology in teaching and learning. Stephen Downes and George Siemens are Canadian researchers who introduced the term *connectivism*, which refers to the describing of learning networks. Connectivism built upon social constructivism but defined learning as taking place in a world in which people are connected to sources of knowledge through vast worldwide computer networks (Siemens, 2005).

Connectivism brings constructivism a step further and adds interaction with fellow learners as a source for constructing meaning. Siemens (2005) believed connectivism influenced MOOC learning. Siemens defined connectivism as follows:

> The integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements—not entirely under the

> control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing. (p. 4)

Connectivism theory is enhanced by the key principles of learning through diversity (i.e., knowledge grows by presenting diverse opinions). Learning is based on connecting information sources and nodes. Knowledge might be acquired from nonhuman appliances and facilitated by technology. Learners are looking for connections and try to make sense of ideas, fields, and concepts. The intent of connectivist learning activities is the currency of information and keeping the knowledge up-to-date. Online and network tools provide learners with reliable, current, and developing knowledge. Lastly, learning is a continuous process; there is no ending—what is learned right now might be altered later because it is dependent on alterations in information and decision-making (Siemens, 2005).

Siemens (2005) believed the learning situation should be dynamic and learner-centered. In his view, learning knowledge has a new meaning when situated in a network consisting of diverse perspectives due to reflection on the

combined force of individual elements. He argued that in reality, organizations and people need to stay current; it is not appropriate to ask them to keep taking classes periodically. Most of the traditional sources such as textbooks and classes are limited in terms of currency. Textbooks were written years before they might be used, and classes are only available for a certain time.

Learners need to create a network of specialized and proficient people in their field to keep knowledge up-to-date. Siemens (2005) argued that behaviorism, cognitivism, and constructivism have limitations regarding how learning occurs within an organization or a network. These theories have focused on how learning happens inside the learner. Even social constructivism was more focused on an individual physical presence and on brain-based activities as a socially enacted process. Nevertheless, connectivism "is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing" (Siemens, 2005, Connectivism section, para. 1).

Social Presence

Research findings indicate that social presence between learners and learners, and learners and instructors in online learning environments, including MOOCs, may allow learners to have positive emotional experiences that

attribute satisfaction through the online community (Johnson, Hornik, & Salas, 2008; Hodgson, Kajimoto, & Hui, 2017).

Social presence is defined as the "degree of salience of the other person in the interaction and the consequent salience of interpersonal relationships" (Short, Williams, & Christie as cited in Gunawardena & Zittle, 1997, p. 151). Richardson and Swan (2003) interpreted social presence "as the degree to which a person is perceived as 'real' in mediated communication" (p. 70).

Gunawardena and Zittle (1997) discussed "immediacy" and "intimacy" as emerging concepts in the social presence literature (p. 152). High levels of immediacy can exist when using technologies such as videoconferencing and learners can physically see one another. However, visual cues and immediacy are lost in most online learning environments where interactions mostly occur via text in discussion boards. Hence, learners' and instructors' social presence via text-based technology tools becomes critical in online learning environments.

Gunawardena and Zittle (1997) described the importance of developing online environments that encourage discussion and collaboration through specific facilitation and instructional design efforts. For instance, Gunawardena and Zittle recommended "moderators should start the conference with introductions and social exchanges if the system used is a listserv, or create a

separate area for social chit chat in a conferencing system" (p. 164). Richardson and Swan (2003) found that college students' "perceptions of social presence in online courses are a predictor of their perceived learning," as well as their satisfaction with their instructor (p. 79). These findings reinforce that online learners value immediate and intimate relationships, and these experiences influence students' perceptions of learning and instructor quality in the courses. Richardson and Swan (2003) recommended that online courses "should not only present the information and materials to students but also incorporate the social aspects of learning in both the design and instruction" (p. 81).

Wei and Chen (2012) developed and tested a questionnaire with online learners participating in classes from three institutions in Taiwan (n = 522) to verify a proposed conceptual model for measuring social presence with "five main constructs including user interface, social cues, social presence, learning interaction, and learning performance" (p. 531).

Wei et al.'s (2012) study "evidenced that social presence has significant effects on learning interaction, which in turn has significant effects on learning performance" (p. 540). Wei et al. (2012), much like Richardson and Swan (2003), ultimately recommended online courses be designed to promote learner interaction with instructors and classmates to positively impact learning. In

accord with Gunawardena's (1995) recommendation, Wei et al. (2012) advised instructors to "invite learners to participate in course activities through guidance, encouragement, grouping, and reward" (p. 540).

Social presence research in traditional distance education courses involving tens or possibly hundreds of people could have implications for and even be amplified within MOOCs. The early cMOOCs were concerned with providing tools to help learners connect, while the xMOOCs models are focused on providing information and oftentimes do not require learner interaction (Rodriguez, 2012). In most current MOOC models, instructors present content through a series of pre-recorded videos, learners work through assignments, and while discussion boards are provided, learners are often not required to post in the boards.

Community of Inquiry

The Community of Inquiry (CoI) framework has been used in traditional online learning environment to describe and analyze learners' experience. Most recent studies have validated the suitability of CoI framework within the context of MOOCs (Kovanović, Gašević, Hatala, & Siemens, 2017; Cohen & Holstein, 2018).

Turkle (2005) acknowledged the need for a sense of community in virtual environments, in addition to promoting individual social presence in online learning. Turkle posed the following larger-scale questions: "What is the nature of our social ties? What kind of accountability do we have for our actions in real life and in cyberspace? What kind of society or societies are we creating, both on and off the screen?" (p. 231). These questions point to the idea that we are not alone online. The internet provides an even greater level of connectivity to one another than everyday face-to-face relationships and interactions. We live and work together in the real and virtual worlds, and it is through these ever-developing and changing communities that we learn.

Garrison et al. (2000) developed the Community of Inquiry framework to "connect the human issues around online, text-based communication, the teaching issues associated with the use of this mode of education, and the overall cognitive goals" of an online graduate program (p. 5). The authors maintained that three types of presence are found in a distance-education learning environment: social, teaching, and cognitive (Garrison et al., 2010). Figure 2.1 displays a visual representation of the CoI framework.

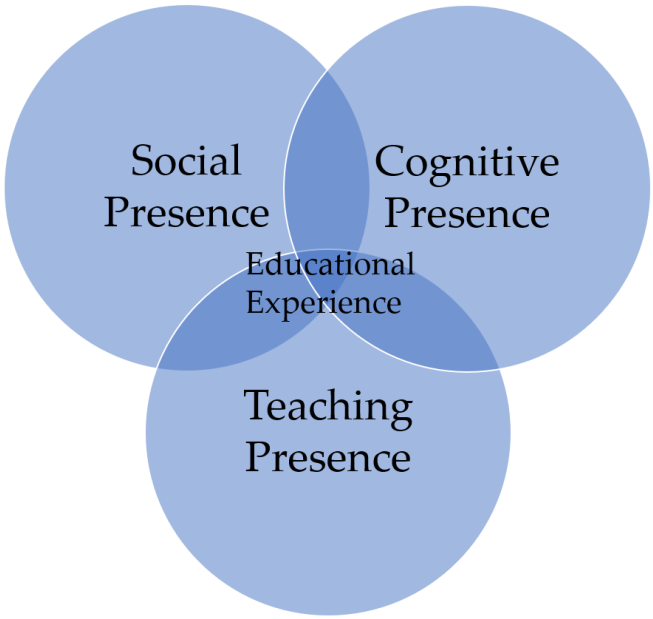


Figure 2.1 CoI framework Adapted from Garrison et al. (2010).

Social presence encompasses interactions between learners and instructors. Teaching presence takes into account "teacher immediacy behaviors," meaning "teachers' use of verbal and nonverbal immediacy and the impact of those behaviors on students" among other factors such as instructional design (Richardson & Swan, 2003, p. 70). Cognitive presence is focused on learners' engaging in "reflective thought" and is based on John Dewey's Practical Inquiry (PI) model (Garrison et al., 2010, p. 6). PI has four phases: "triggering event, exploration, integration, and resolution" (as cited in Garrison et al., 2010, p. 5). As the CoI framework illustrates, the three types of online presence overlap and combine to create the online educational experience.

Motivation

Motivation is one of the most critical factors explored in MOOC studies. Hew and Cheung (2014) summarized the motivations and challenges of using MOOCs. Their study shows that students mainly have the following motivations when enrolling in MOOCs: extending knowledge, curiosity about MOOCs, personal challenge, and obtaining certificates. They also discovered that the motivations of MOOC instructors included curiosity, personal rewards, and a sense of altruism. However, instructors also faced challenges such as choosing appropriate assessment methods, lecturing without a live audience, the time-consuming and money-consuming nature of MOOCs, and fostering interaction in online discussion forums.

Graham and Weiner (1996) defined motivation as "the study of why people think and behave as they do" (p. 63). Graham and Weiner (1996) further categorized motivation into "the choice of behavior," "the latency of behavior," "the intensity of behavior," "the persistence of behavior," and "the cognitions and emotional reactions accompanying the behavior" (p. 63). Motivation can be used to explain why people choose to do certain things and how much effort they put into doing them (Graham & Weiner, 1996; Keller, 2010). People with motivation toward certain things will be active in doing these things, while those

who are not motivated will act passively in performing tasks (Ryan & Deci, 2000). Motivation is a complex issue in that it is dynamic and no widely accepted rules exist to predict it (Keller, 2010). Different people have motivation toward different things. Even in a case involving the same person and the same thing, motivation varies in different situations or at different times (Hartnett, St. George, & Dron, 2011; Ryan & Deci, 2000).

Motivation is critical in education. Small and Gluck (1994) asserted that students' motivation was essential and as important as their learning abilities and their learning achievements. Prensky (2002) claimed that motivation was so important in learning because "learning requires effort" (p. 5). Due to the uniqueness of online learning, learners' motivation becomes a well-investigated issue in the online learning environment. In a literature review, Bekele (2010) found that most studies being reviewed have reported that the internet-supported learning environment (ISLE) is itself a motivator to learners; and ISLE also supports learners' satisfaction. Moore and Kearsley (2011) considered learners' motivation as a critical factor related to learners' success in distance education. Studies have found that learners enrolled in online courses show stronger intrinsic motivation than their peers enrolled in traditional courses (Rovai, Ponton, Wighting, & Baker, 2007; Wighting, Liu, & Rovai, 2008).

Motivation is significantly related to learners' online course achievement (Klein, Noe, & Wang, 2006). Interestingly, Martens, Gulikers, and Bastiaens (2004) found that learners with higher intrinsic motivation did not achieve greater results than their peers who had lower intrinsic motivation. Instead, students with higher intrinsic motivation show more exploratory learning behaviors than their peers. Learners who show higher motivation are able to confront obstacles and to adjust their own emotional status better and more easily (Bird & Morgan, 2003). Hartnett et al. (2011) found that online learners reported both learners' intrinsic motivation and extrinsic motivation, meaning that designing instruction to promote extrinsic motivation is necessary in online learning.

A study conducted by Clayton, Blumberg, and Auld (2010) revealed that students who preferred different educational environments—traditional courses and online courses—had different motivational components. Students who chose traditional courses believed that the format suited their learning style better, and thus, they were willing to spend more time and put more effort into learning, whereas students who preferred an online format were more confident that they could deal with the online learning.

Several indicators, according to research studies, affect students'

motivation. The literature review on internet-supported learning described that external as well as internal factors affect learners' motivation in an internet-supported learning environment (Bekele, 2010). External factors include the technologies in the course, the quality of the course/program design, student support service, and more. Different strategies must be used to judge and to promote learners' motivation in online learning environments, different from face-to-face instruction in which teachers can observe students' reactions to judge their motivation or provide immediate verbal feedback or emotional support to those whose motivation is low (Frymier & Shulman, 1995; Meyer & Turner, 2006).

The literature studying the online learning environment has widely examined completion and dropout rates, and researchers have consistently identified motivation and its constructs as important factors influencing the online retention rate. Song (2000) stated that "when learners do not have proper motivation to persist, they will drop the course or they will procrastinate" (p. 227). Emotional support from faculty and friends as well as learners' self-efficacy were important factors for students who persisted in distance learning (Holder, 2007; Park & Choi, 2009). A literature review conducted by Hart (2012) revealed that learners' motivation was one of the most important components that made

them persist in online learning environments.

Merely admitting the importance of motivation in online learning environments or examining the characteristics that help learners succeed in online courses is not enough; researchers and practitioners have also explored methods to increase learners' motivation by way of instructional design.

Keller (2010) defined motivational design as the process of arranging resources and procedures to bring about changes in motivation. Motivational design is based on scientific literature on human motivation" and includes principles and rules to guide a longer systematic process (Keller, 2010). Keller (2010) pointed out that motivational design is not isolated when used in designing instruction; instead, it should be integrated into instructional design models. Compared with the extrinsic rewards used commonly in education, the goal of motivational design is to make instruction appealing to learners and make learning match students' interests and goals (Keller, 2010; Wlodkowski, 1978).

Self-Regulated Learning

Self-regulated learners, who are aware of their own learning and able to control their learning based on their goals and reflect on their learning progress and adapt any strategies to assist learning, are more likely to succeed in a MOOC

learning environment (Littlejohn, Hood, Milligan, & Mustain, 2016).

Self-regulated learning has been defined as "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment" (Pintrich, 2000, p. 453).

Self-regulated learning does not necessarily happen to one learner all the time; instead, a learner can be self-regulated in one learning task but not in another (Pintrich, 1999; Zimmerman, 1986). Self-regulated learning models often "derive their constructs from an analysis and application of psychological models of cognition, motivation, and learning" (Pintrich, 2004, p. 388). To further define self-regulated learning, Pintrich (1999) illustrated how self-regulated learners are able to use "cognitive learning strategies, self-regulatory strategies to control cognition, and resource management strategies" (p. 460). Cognitive learning strategies refer to strategies that can help learners' academic performance, such as strategies that help understanding or memorizing. Self-regulatory strategies involve methods that assist learners' own awareness of their cognition and the abilities to control their learning behaviors. Resource management strategies include strategies to optimize learning resources such as

time and locations (Pintrich, 1999).

Within the self-regulated learning model, Pintrich (2004) developed the four-phase framework of self-regulated learning to better explain the step-by-step process of how learners may use self-regulation. Pintrich (2004) proposed that, first, self-regulated learners plan time and resources based on the goals they set for specific learning tasks under certain circumstances. Second, they monitor their own cognition, motivation, behaviors, contexts, learning tasks, and so on during the actual learning process. Third, based on these self-monitoring results, self-regulated learners make adaptations by using various cognitive and self-regulatory strategies for their own learning process and for the specific contexts. In the fourth phase, learners reflect on their learning process, including their cognition, motivation, and behaviors.

Many scholars in addition to Pintrich considered motivation to be deeply embedded in self-regulated learning. Learners' goals, beliefs about self-efficacy, and affections can all affect self-regulation (Schunk, 2005). Researchers have found that learners who have intrinsic goals (learning or mastery) for learning tasks tended to use more self-regulated learning strategies (Kolić-Vehovec, Rončević, & Bajšanski, 2008; McWhaw & Abrami, 2001; Wolters, Shirley, & Pintrich, 1996). Students who were also confident in their academic abilities (high

self-efficacy perceptions) used more self-regulated learning strategies when learning (Zimmerman & Martinez-Pons, 1990). Pekrun, Goetz, Titz, and Perry (2002) found that students' academic emotions were closely related to their self-regulated learning strategies and academic performances; therefore, the authors advocated that students' emotions should be taken into consideration when researchers and educators examined performance and self-regulated learning.

Interaction Equivalency

Interaction equivalency is a design theory that is particularly relevant to online learning, including MOOCs. Anderson (2003) described interaction equivalency as a triad of interaction between the learner and the content, the learner and the instructor, and the learner to other learners. As the figure shown below, the learner is at the center with links to the three interactions. If one type of interaction decreases, interaction between the other two must increase.

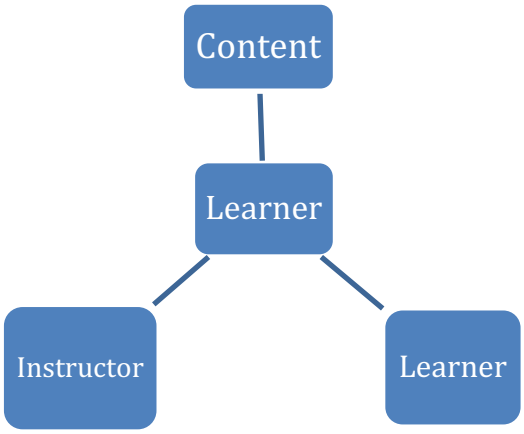


Figure 2.2 Learning Triangle Adapted from (Anderson, 2003)

In MOOCs, typically there is less interaction between the learner and the instructor. MacIsaac (2012) found that with the massive nature of MOOCs in general, in terms of the number of students enrolled, instructors are not able to maintain the kinds of meaningful interactions with the students as has become the standard for face-to-face and other online courses. As a result, in the connectivist based cMOOC, the interaction between learner and learner increases; however, in the more linear and traditionally formatted xMOOC, the interaction between learner and content increases. Rodriguez (2012) examined two successful MOOCs with these two different formats and found that while the xMOOC (AI-Stanford like) took a more traditional approach to instruction,

there was still a low interaction between the instructor and the learner, and therefore interaction with the content increased. In the case study conducted by Chamberlin and Parish (2011) into the experiences of two MOOC learners, the learners engaged more with the course content and their fellow learners. Chamberlin and Parish found because of the scale or the number of learners enrolled, instructor interaction was difficult to maintain. Kop et al. (2011) found there was low facilitator presence in their mixed method research study of two MOOC courses. Kop et al. also found that diminished instructor contact and the number of other learners involved with the course was intimidating to many of the learners. Miyazoe and Anderson (2010) attempted to clarify design issues in MOOCs and specifically researched interaction equivalency in their study of three variants of MOOC courses. In the xMOOC courses, Miyazoe and Anderson found the learner-to-content interaction was high, the learner-to-teacher interaction was low, and the student-to-student interaction was medium. In the cMOOC courses, learner-to-content interaction was medium, learner-to-instructor interaction was low, and learner-to-learner interaction was high. Miyazoe and Anderson also looked at a variant of MOOCs referred to as sMOOCs that used a social constructivist design and found learner-to-content interaction was medium, learner-to-instructor and learner-to-learner interaction

were both high. Incorporating instructional design strategies will support these varied interactions.

Situational Principles

Designers should take situational principles into consideration when designing online courses including MOOCs. Situational principles reflect the situation or circumstance in which instruction is taking place when considering instructional design (Reigeluth, Carr-Chellman, Beabout, & Watson, 2009). This includes the delivery method as well as the expected outcomes. Lunce and Huang (2013) called this "situational awareness" (p. 18) and stated that this is part of the analysis of the context element of instructional design and instructional design models. Lunce and Huang described how transactional distance could affect learning and that instructional designers must be aware of the situation in which instruction is to take place in order to mitigate the effects of transactional distance. Lunce and Huang also stated that situational awareness has relevance in distance education because the designer must be aware of the reality of how and when learners will be working on the course requirements. The designer must account for learners interacting with the content and encountering problems or becoming frustrated and seeking help or feedback (Lunce & Huang, 2013).

In addition, Fauser, Henry, and Norman (2006) compared the models discussed by Gustafson and Branch (2002) and concluded that instructional designers must have knowledge of more than one instructional design model so they can fit the design to the situation. Nam and Smith-Jackson (2007) criticized the lack of consideration for the "integration of the user interface design with instructional design" (p. 23). Some of the interface design considerations that factored into the design of online courses in general and MOOCs in particular include the technology for delivery and the increasing use of social media such as Facebook and Twitter. Farajollahi, Zare, Hormozi, Sarmadi, and Zarifsanaee (2010) provided a conceptual model for effective distance education in higher learning, including design for technological support to encourage learner engagement with the activity rather than learning the technology. Casey and Evans (2011) reviewed the implications involved in using social media for learning from an action research study performed by Casey. Through situational analysis, Casey and Evans concluded that as much informal learning was going on as formal. Because of the situation in which the instruction was taking place (in social media), learners were learning from each other as well as from the instructor. This use of social media supports the social learning theory discussed in the previous section. Blaine (2010) focused on the relationship between mode

of delivery and course completion and found that different modes of instruction required the same material to be constructed or designed differently to be effective. In a MOOC environment, careful consideration should be made of instructional strategies that will enhance peer learning and similar instructional strategies to allow for limited or non-existent input from the instructor during the course.

In summary, this chapter reviewed the evolution of MOOCs, the gaps in the literature, and the key learning theories that are most relevant to MOOC experience and design including connectivism, social presence, community of inquiry, motivation, self-regulated learning, interaction equivalency, and situational principles.

Chapter 3: Methodology

This chapter proposes the methodology and design of this study, presents details about the research instruments, and explains the process of data collection and data analysis. In addition, it provides information about how this study establishes reliability and validity, as well as the limitations and the ethical considerations of this study.

Research Design

This study used mixed-methods, including both quantitative and qualitative methods, to answer the research questions. The mixed-methods design aimed at collecting, analyzing, and combining document analysis, survey, and interview data within a single study to inform interpretations and draw implications on how to design MOOCs for Chinese students.

The research followed these stages:

1. Literature review and document analysis:

   This study started with a literature review from journal and conference articles published in both English and Chinese. Key ideas and concepts were generated based on the review. The MOOC theories and models used in China and in the United States were compared based on the following aspects: educational theories related to

MOOCs, instructional design theories related to MOOCs, and MOOC research on attributes of the learning environment and student experience. Key differences and similarities between the two models were generated.

2. Survey

   Survey studies were used to investigate students' experience and perspectives on a larger scale. A questionnaire was administered to groups of Chinese students who had taken MOOCs from Western universities. The survey collected data on the students' personal demographic information such as age, gender, and academic status and their motivation and self-regulated learning behavior in participating in MOOC-based study. This questionnaire asked open-ended questions by which the participants shared their background knowledge, if any, about MOOC experience.

3. Interview:

   From the survey participants, eighteen students were recruited for interviews to investigate each subject's learning experience using MOOCs. Each participant's experience was deemed a case study. By doing a case study, the researcher recorded an intensive, holistic

description and analysis of a single participant's experience. The participants were invited to take part in semi-structured interviews. During the interviews, the students were asked a set of open-ended questions that elicited an in-depth description of their experiences in taking Western MOOCs. According to Patton (2002), "open-ended interview responses yield people's experience, perceptions, opinions, feelings, and knowledge" (p. 4). Data collected from interviews were analyzed alongside quantitative data from the questionnaires. Multiple measures are expected to provide sufficient data for a thorough and in-depth analysis (Creswell, 2014). The interviews provided a holistic picture of the participants' experience and helped in understanding, explaining, and exploring their perceptions in depth and detail.

4. Combined data analysis:

   By analyzing the results gathered from the previous stages and combining data from document analysis, interviews, and surveys, implications were drawn on the instructional design practices that worked for Chinese students and those that did not so that

instructional designers can design MOOCs more effectively for Chinese students in the future.

Figure 3 shows the workflow of this study:

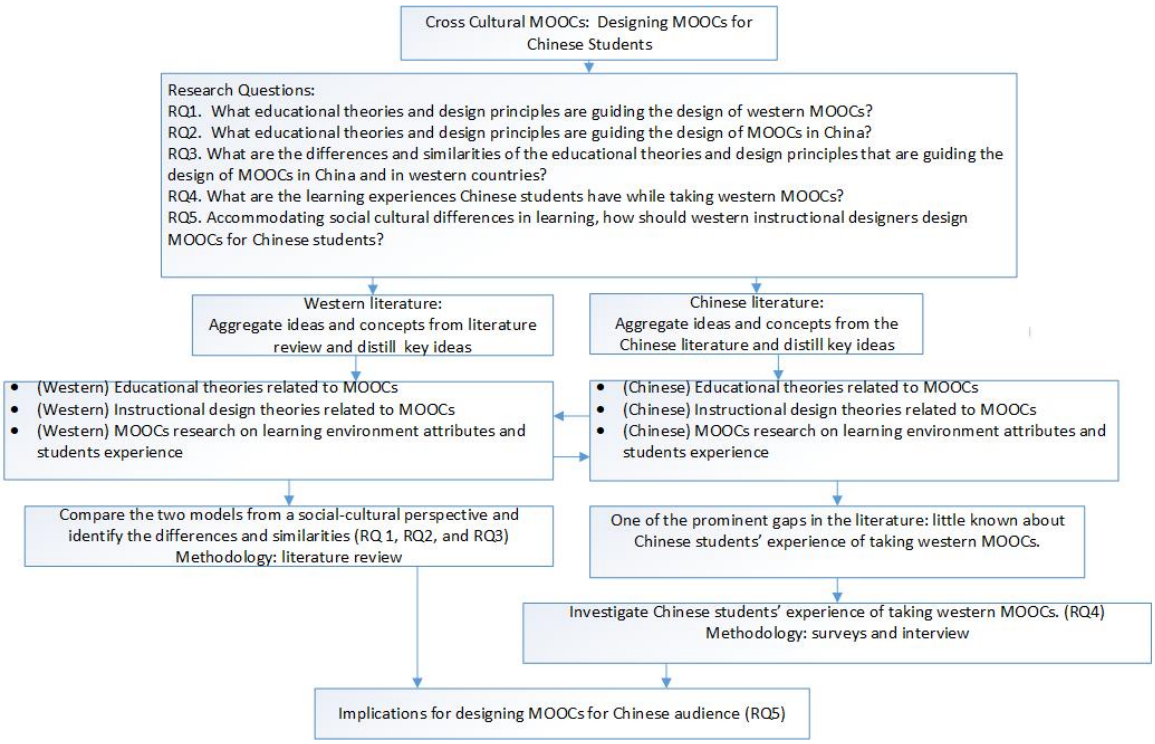


Figure 3. Study workflow.

The data collection matrix in Table 3.1 guided how data were systematically collected according to each research question. The research questions "What educational theories and design principles are guiding the design of Western MOOCs?" as well as "What educational theories and design principles are guiding the design of MOOCs in China?" and "What are the differences and similarities between the educational theories and design

principles that are guiding the design of MOOCs in China and in Western countries?" were answered by literature review and document analysis. The research question "What are the learning experiences Chinese students have while taking Western MOOCs?" was answered by using data from survey and interviews. The last research question, "Accommodating socio-cultural differences in learning, how should Western instructional designers design MOOCs for Chinese students?" was answered by analyzing all the data sources mentioned.

Table 3.1

Data Collection Matrix

Research Process	**Research Questions**	**Data Sources**	**Analysis Methods**
1. Document analysis	What educational theories and design principles are guiding the design of Western MOOCs? What educational theories and design principles are guiding the design of MOOCs in China? What are the differences and similarities between the educational theories and design principles that are guiding the design of MOOCs in China and in Western countries?	Journal and conference papers	Document analysis

2. Survey	What are the learning experiences Chinese students have while taking Western MOOCs?	Survey results; interview transcripts	Descriptive statistical analysis; Qualitative Coding
3. Interview			
4. Combining all the data sources mentioned	Accommodating socio-cultural differences in learning, how should Western instructional designers design MOOCs for Chinese students?		

Literature Review and Document Analysis

This literature review summarized the educational theories and design principles that were guiding the design of Western and Chinese MOOCs and compared the similarities and differences between the theories and guiding design principles in the two cultures. The researcher used Google Scholar to search for keywords like "MOOC design," "MOOC theories", "MOOC design models", and "MOOC paradigm." The researcher focused on articles that were published in peer-reviewed journals, in conference proceedings, and written in English. The researcher also searched two stand-alone libraries (EdITLib Digital Library and the Educause Library), both of which focused on educational technology materials. The EdITLib Digital Library provided access to an extensive library of conference proceedings.

Among the MOOC-related literature in English, very little research was available regarding MOOCs in China. The researcher searched for literature published in the journal paper library of the mainland China Academic Journal Network Publishing Database (CAJD) and identified hundreds of academic papers written in Chinese about MOOCs in China.

Survey

Context and Participants Selection

The target participants for the survey study were undergraduate students in China who had taken MOOCs from Western universities. The participants who met the following criteria were selected for this study:

- They are currently registered undergraduate students in one of the universities in mainland China.
- They have taken at least one MOOC from a Western university.

The invitation to participate in this study was sent out to a broad audience through popular Chinese social media such as Tencent QQ[1] and WeChat[2] MOOC

[1] Tencent QQ, also known as QQ, is an instant messaging software service developed by the Chinese company Tencent Holdings Limited. QQ also offers services that provide online social games, music, shopping, microblogging, movies, and group and voice chat.
[2] WeChat (微信) is a mobile text and voice messaging communication service developed by Tencent in China. WeChat provides text messaging, hold-to-talk voice messaging, broadcast (one-to-many) messaging, video conferencing, video games, sharing of photographs and videos, and location sharing. The Chinese students who enroll in MOOCs often have study groups on WeChat.

study groups. Participation in this study was completely voluntary. The sample of participants were self-selected, and therefore may not be representative of the entire population.

Survey Design

A survey was created to explore Chinese students' online learning experience with Western MOOCs. The survey covered questions about learners' overall experience and perceptions, their motivation for taking MOOCs, and self-regulated learning. The survey questions were reviewed and validated by experts.

For this study, the instrument was adapted based on the instruments in published research studies on students' perceptions of online learning experiences (Smart et al., 2006; Song et al., 2004), and SRL and motivation (Fontana et al., 2015; Hood et al., 2015; Littlejoin et al., 2016).

The survey questions were divided into six categories. See Table 3.2 for a detailed categorization. The first section of the questionnaire served as a screening device. The participants who were not currently undergraduate students in China and had not taken any Western MOOCs were excluded from the study.

Table 3.2

Survey Design

Survey Categories	**Survey Questions**	**Survey Number and**
Screening questions	• Are you currently an undergraduate student in a university in mainland China? • Have you taken at least one MOOC from Western universities?	Q1 and Q2
Background	• What's your gender? • Which university are you enrolled in? • What's your major? • Which year are you in college? • Where did you hear about MOOCs? • What MOOC platform have you used? • What MOOC-based subjects have you taken? • How many Chinese MOOCs have you taken? • How many MOOCs from Western universities have you taken?	Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11
Motivation	• Have you ever dropped out of any Chinese MOOCs? Why? • Have you ever dropped out of any Western MOOCs? Why? • What's the primary reason why you are taking MOOCs? • What are your criteria for choosing which MOOC to take? • What factors motivate you to take MOOCs?	Q12, Q13, Q14, Q15, & Q16
Self-Regulated Learning (SRL)	• How true are the following statements (on self-regulated learning behavior)?	Q 17

Overall experience and perceptions of taking MOOCs	• How much time have you spent on the following activities in a MOOC course? Please order it from the longest time to the shortest time. • What are the top three activities on which you prefer spending the most time in a MOOC course? • What are the barriers you have encountered during MOOC-based study? • How true are the following statements about the support you received during your MOOC-based study? • What are the greatest benefits you received by taking MOOC courses? • What are your perceptions of taking MOOCs?	Q18, Q19, Q20, Q21, Q22, Q23
Open questions	• What other feedback or suggestions do you have for MOOCs? • Would you be interested in participating in follow-up interviews?	Q 24, Q25

Survey Data Collection

The survey instrument was first pilot tested on a few selected students and reviewed by experts, including committee members and education experts. The goal of the pilot study and expert review was to validate the instrument and to test its reliability. Based on the pilot test results and expert review feedback, some of the survey items were revised.

The questionnaire was created online through Wenjuanxing (问卷星)[3], a free online survey tool for researchers in China (http://www.sojump.com/). The questionnaire also included links to the "Information Letter for Participants" and "Participant Consent Form." The survey was shared with over 300 potential participants through Tencent QQ and WeChat study groups. Please refer to Appendix A for detailed survey questions, Appendix C for Information Letter for Participants, and Appendix D for Participant Consent Form. To encourage participants to fill out the survey, the researcher offered a $50 lottery drawing for participants who had completed the survey.

Survey Data Analyses

Data screening was used to identify data results that included the descriptive statistics for all the survey factors. Descriptive statistics for the survey items were summarized in the text and reported in a non-statistical format. Frequency analysis was conducted to identify valid percentages for responses to all the questions in the survey. The results of the analysis were reported in the form of a discussion.

[3] Wenjuanxing (问卷星)is a survey tool that offers reliable and reputable services, similar to SurveyMonkey. Over 90% of academic and research institutions in China use the survey service offered by Wenjuanxing.

Survey Reliability and Validity

The stability (test-retest reliability) of the survey instrument were obtained through pilot testing. Content validity showed the extent to which the survey items and the scores from these questions were representative of all the possible questions about student experience of taking MOOCs. For content validity, the wording of the survey items was examined by a group of education and research experts at Boston University and Microsoft Corporation. This step helped to assess whether the survey questions were relevant to the subject it was aimed to measure, if it was a reasonable way to gain the needed information, and if it was well-designed.

Interview

Interview Process

The qualitative phase of the study focused on understanding and elaborating the results of the numerical data obtained during the survey phase of data collection. A case study research design was used to collect and analyze the qualitative data. The case study approach served the purpose of elaborating the research survey and further addressing the research questions "What are the learning experiences Chinese students have while taking Western MOOCs?" and "Accommodating socio-cultural differences in learning, how should Western

instructional designers design MOOCs for Chinese students?"

Eighteen interview candidates were recruited from those participants who had completed surveys. Detailed invitations and written consent were sent to the participants who met the recruiting criteria of the study and who had indicated their willingness to participate in interviews.

See Appendix 3 for Information Letter for Participants and Appendix 4 for Participant Consent Form. A gratuity of 130 Chinese Yuan was paid to those participants who completed the in-depth interviews, and an additional 50 Chinese Yuan for answering follow-up questions.

An interview guide that contained open-ended questions was used for conducting the interviews. This open-ended structure allowed the researcher to establish a conversational style, word questions simultaneously, and focus the conversation within the research subject. The participants were given as much opportunity as possible to tell the details of their stories. See Appendix B for Interview Protocol.

All interviews were conducted in Chinese through video-conferencing on Skype, WeChat or QQ. Each interview lasted about 45 minutes. E-mails to ask brief follow-up questions were sent to participants after the interviews. The interviews were digitally recorded and transcribed. After each interview, the

researcher also made notes about the initial thoughts related to the participant's experience, as well as ideas about any follow-up questions to ask the participant by e-mail.

Interview Data Analysis

During the qualitative phase of the study, the data obtained through the interviews were coded and analyzed for themes. The qualitative analysis included the following steps: (a) preliminary exploration of the data by reading through the transcripts, writing memos, and observations; (b) coding the data by segmenting and labeling the interview texts; (c) using codes to develop themes by collecting similar codes together; (d) connecting and interrelating themes; and finally, (e) constructing a narrative. To support the qualitative data, a code book and visual data display were created to show the evolving conceptual framework of the factors and relationships in the data. Data analyses involved developing a detailed description of each context and each student's learning experience. All these analyses were done in Chinese. Finally, the important findings were summarized and translated into English. The translated parts were reviewed and validated by professional translators.

Establishing Credibility and Reliability

The criteria for judging a qualitative study differs from the survey research. In qualitative design, the researcher seeks believability based on coherence, insight, and instrumental utility and trustworthiness through a process of data verification rather than through traditional validity and reliability measures. To validate the findings (i.e., to determine the credibility of the information and whether it matches reality), four primary forms were used in the qualitative phase of the study: (a) triangulation—converging different sources of information (interviews and survey results); (b) member checking—obtaining feedback from the participants on the accuracy of the identified categories and themes; (c) providing rich, thick description to convey the findings; and (d) external audit—asking a person outside the project to conduct a thorough review of the study and report back.

Establishing Credibility for an International Study

To ensure the validity and credibility of the international study, consultants or professional translators were hired to validate/translate the surveys and interview protocols into Chinese and to translate the results of the survey and interviews into English. The detailed steps were as follows:

- A qualified Chinese professional translator was hired to translate all English questionnaires and the interview protocol into Chinese.
- The participants filled out the Chinese-version questionnaires.
- The interviews were conducted in Chinese.
- Two qualified professional translators were hired to work as inter-raters to help with categorizing and coding these Chinese transcriptions into proper themes.
- The important findings based on the results were summarized and translated into English.
- The translated parts were reviewed and validated by the professional translators.

Research Permission and Ethical Considerations

Ethical issues were addressed at each phase in the study. In compliance with the regulations of the Institutional Review Board (IRB), permission to conduct the research was obtained.

A participant consent form and an information letter for participants were developed. The consent form and information letter stated that the participants were guaranteed certain rights, agreed to be involved in the study, and acknowledged their rights were protected. The survey included links to the

consent form and information letter, reflecting acceptance and compliance in participation.

The anonymity of participants was protected by alphanumerically coding each returned questionnaire and keeping the responses confidential. In the individual interviews with the selected respondents, participants were assigned pseudo names for use in description and reporting the results. All the electronic data including survey files, interview audio recordings, and transcripts, were password-protected and stored in a local hard drive. All the paper materials were kept in locked metal file cabinets in the researcher's home office. All study data were destroyed after a reasonable period of time. Participants were told that a summary of the data were disseminated to the professional community, but in no way it would be possible to trace responses to individuals.

Role of the Researcher and Limitations

Researcher's Role

The researcher's involvement with data collection in the survey and interview phases of this study was different. During the survey phase, the researcher administered the survey and collected the data using standardized procedures, including convenience sampling, naturally existing groups, and reliability and validity checks of the instrument. The data analyses were

performed using descriptive analysis, and the results were interpreted based on the responses to each survey question and the research questions.

During the interview phase, the researcher assumed a more participatory role due to the "sustained and extensive experience with participants" (Creswell et al., 2003). The researcher recruited the participants through back-and-forth emails, conducted face-to-face online interviews, and connected with participants through WeChat and QQ for follow-up questions. All these experiences introduced a possibility for subjective interpretations of the phenomenon being studied and created a potential for bias (Patton, 2002). Extensive verification procedures, including triangulation of data sources, member checking, and thick and rich descriptions of the cases were used to establish the accuracy of the findings. Furthermore, a careful audit was done by the researcher's academic advisor and dissertation supervisory committee on all research steps, data procedures, and data analyses during this study.

Limitations

Some limitations were to be anticipated in this study. The researcher recruited participants for surveys and interviews through social media. Students who responded to survey/interview requests and who decided to participate in this study were completely voluntary and self-selecting. As a result, the sample

of participants in this study may not be representative of the entire target population of undergraduate students in mainland China. Therefore, the results from qualitative and quantitative analyses may not be generalizable or interpreted for the entire population.

Chapter 4: Results

This study was conducted to explore the design theories and principles for MOOCs in both Western and Chinese literature, investigate Chinese students' experience of taking Western MOOCs, understand the social-cultural factors that shape their experience, and identify ways to better design MOOCs for Chinese students. The dissertation data analyses and explanations are presented in three sections.

The first section offers a summary and comparison of MOOC design theories and principles from both Western and Chinese literature.

The second section presents the results of a survey that targeted undergraduate students in China who have taken at least one Western MOOC. The survey data provided information on the characteristics of 58 participants, including drop-out experience with MOOCs; motivations for taking MOOCs and criteria in choosing MOOCs; self-regulated learning behavior; activities and time spent on MOOCs; and self-reported barriers, support, perceived benefits, and general perception of MOOCs.

The third section presents an in-depth analysis of follow-up interviews that were conducted with 18 participants. The interview results further explored the participants' motivation, perceptions, and experience with MOOCs;

investigated the social and cultural factors that may have influenced students' experience; and provided implications involving design considerations for a Chinese audience.

Document Analysis

MOOC Design and Theories in Western Literature

To investigate MOOC design theories and principles in Western literature, the researcher used Google Scholar to search for keywords like "MOOC design," "MOOC theories," "MOOC learner characteristics," "MOOC design models," and "MOOC paradigm," concentrating on articles that were published in peer-reviewed journals. The researcher also searched two stand-alone libraries (EdITLib Digital Library and the Educause Library), both of which focused on educational technology materials.

In order to be included in the corpus, each identified paper had to provide insights on the research question: "What educational theories and design principles are guiding the design of Western MOOCs?" The papers needed to focus on one of the following: (a) MOOC learning concepts or theories, (b) pedagogical or technological principles, or (c) MOOC design models. Moreover, the chosen papers were published between January 2011 and December 2017 and written in English. The reason for selecting 2011 was that this was when MOOCs

began to be used extensively in online learning (Sunar et al., 2015). As a result, 118 papers were identified as most relevant in terms of learning theories, pedagogical design, technological design, and design models.

Table 4.1 displays a breakdown in terms of the focus of the chosen Western literature that fit the specified criteria.

Table 4.1

Western Literature on Educational Theories and Design Principles of MOOCs

Topics	Number of Papers	Percentage
Theories and concepts	37	31%
Pedagogical design	55	46%
Technological design	15	13%
Design models	11	9%

Of the reviewed papers, 31% focused on learning theories and concepts that are relevant to MOOCs. Connectivism, the theoretical foundation of cMOOCs, received a heavy focus as a new paradigm of learning and teaching in higher education (Milligan et al., 2013; Rodriguez, 2012). Since both cMOOCs and xMOOCs have advantages and disadvantages, the concepts of blended MOOCs and Small Private Online Courses (SPOCs) were also explored in the literature.

Of the reviewed papers, 46% focused on pedagogical design. Designing MOOCs is a complex task. Daniel (2012) warned that delivery of MOOCs should be done with care and caution. MOOCs should follow the accepted design principles associated with any online course, but the very nature of MOOCs mandates additional design considerations, such as learner characteristics, the structure of the courses, and assessment in the MOOC environment (Bremer, 2012).

- Learner motivations. Hakami, White, and Chakaveh (2017) summarized the motivational factors of MOOC learners including learner-related factors, institutional and instructor-related factors, platform and course-related factors, and perception of external control/facilitating conditions.
- Interactions and roles. Some MOOCs, particularly cMOOCs, emphasize learner-to-learner or peer-to-peer–centered interaction over learner-to-instructor interaction. Because of this increase in learner-to-learner interaction and decrease in learner-to-instructor interaction, designers of MOOCs must also consider the changing roles of the instructor and the learner. Because of the lack of direct instruction typical of the MOOC environment, the role of the learner has changed, as well. Learners must now take a more proactive approach to their learning and shoulder more

of the burden of the learning process. The learners must be capable of being self-regulated and working independently. For example, Gil et al. (2012) reviewed an open educational resource course on computer networks in which learners were able to interact with the instructor through a blog but were predominantly required to work through the content on their own. This changing role of the learner can present some difficulties for those learners who do not have the necessary skills to be self-directed. Helping struggling learners find a way to create personal learning environments must be a consideration in the design of a MOOC.

- Structure of the course. Once the learner analysis is complete, the designer will then consider the design of the instructional product or course. Fundamentally, the MOOC environment requires instructional strategies that shift the control from the instructor to the learner. In addition, instructional design strategy must be flexible enough to accommodate large numbers of learners, including those who may not have the necessary prerequisite skills to navigate the course without significant guidance. The instructional strategies must also be flexible enough to allow learners to define their own learning outcomes.

- Assessment. In a massively open environment having possibly thousands if not tens of thousands of learners, assessment can be problematic. Even in the design of modest MOOCs (Daniel, 2012) having fewer registered learners, design for assessment should be considered. The most common method for assessment in MOOCs is the use of auto-graded assignments such as multiple-choice quizzes. However, multiple-choice questions can typically only assess at the "remember," "understand," "apply," and "analyze" domains found in Bloom's taxonomy, which considers multiple domains or levels of cognitive understanding of educational concepts. It is difficult to create auto-graded assessments that can assess at the upper cognitive levels of the evaluating or creating domains, which require the learners to make judgments and to produce their own work product related to the concepts (Sadigh et al., 2012). Another common method for assessment in the MOOC environment is the use of peer-graded assignments. In this case, the learners in the course themselves assess peer-graded assignments. Learners rely on well-structured rubrics to guide them as they determine whether their classmates have achieved the goal of the assignment (Hanz, 2013). Hanz (2013) described the experience of designing a MOOC that had 40,000 enrollees, 30,000 of

whom were active; of these, 3,500 completed the course, and 2,700 received certificates. Hanz used auto-graded assignments and peer-graded assignments to accomplish the assessment component of the course.

Thirteen percent of the reviewed papers discussed the technological design of MOOCs. One major factor for MOOC design is the multi-tool functionality of the courses. For example, in the area of communication alone, many MOOCs had multiple methods for communication: from wikis to blogs to social media such as Facebook. These multiple methods of communication were used singly or in any number of combinations. Learners often decided for themselves which of the available tools were the most appropriate for them. Designers should carefully consider proper use of one or more of these tools so as not to overwhelm learners but to provide them with choices for interacting with others and processing the content.

In recent years, researchers have also been exploring how advances in computer science, machine learning, and artificial intelligence support the personalization of learning on a large scale. Designers such as Sadigh et al. (2012) devised their own computer programs that automatically generated assignments and assessments based on the current work the learner had

submitted. Sadigh et al. created an algorithm that would generate a new problem for a model-based situation based on the learner's answer to the problem the learner had just completed. Additionally, Raghuveer and Tripathy (2016) proposed a reinforcement learning–based algorithm to analyze learner information (derived from both implicit and explicit feedback) and generate knowledge to meet the learner's requirements and capabilities inside a specific learning context. Another example is the virtual learning companion having human traits that was implemented in one of Georgia Institute of Technology's AI courses (Goel & Joyer, 2017).

Nine percent of the reviewed papers discussed using instructional design models to design MOOCs. In addition to the instructional design process and models that were used in traditional online learning such as Backward Design, ASSURE, Problem-Based Learning, and the ADDIE process, new conceptual frameworks and models were proposed particularly for MOOCs.

For example, Alario-Hoyos, Pérez-Sanagustín, Cormier, and Delgado-Kloos (2014) proposed the MOOC canvas, a conceptual framework for educators to describe and design MOOCs. The MOOC Canvas considers 11 interrelated issues organized in two categories: available resources and design decisions. Each of these issues is addressed through a set of key questions that invite the

teaching staff to reflect on and discuss the MOOC main design elements while guiding them throughout the design process. Another example is the 5C MOOC design model that was proposed by Kauffman (2015). This model includes steps for constructing intended learning outcomes, considering prior knowledge/motivational belief, creating content structure, conceiving active learning activities, and conducting summative assessments. In addition, Borras-Gene, Martinez-Nunez, and Fidalgo-Blanco (2016) proposed a gamification cooperative MOOC model (gcMOOC) that can be applied in designing engineering courses. This model provides a set of practical recommendations and tools to improve the motivation, learning level, and completion rate of participants in MOOC courses.

MOOC Design and Theories in Chinese Literature

To investigate MOOC design theories and principles in Chinese literature, the researcher searched the journal paper library of mainland China: the Academic Journal Network Publishing Database (CAJD). The keywords used in the search were "MOOC design," "MOOC theories," "MOOC learner characteristics," "MOOC design models," "MOOC paradigm," or "MOOC localization." To guarantee the quality of research papers, "Chinese Social Science Citation Index (CSSCI)" was chosen for the journal source category.

In order to be included in the corpus, each identified paper had to provide insights on the research question: "What educational theories and design principles are guiding the design of MOOCs in China?" The papers needed to focus on one of the following: (a) MOOC learning concepts or theories, (b) pedagogical or technological principles, or (c) MOOC design models. The retrieval years were from January 2013 to December 2017. The reason for selecting 2013 was that this was the year when MOOCs were first introduced in mainland China. The researcher eliminated irrelevant articles and selected and reviewed the most relevant 42 papers for this research. Table 4.2 shows the categories of these articles.

Table 4.2

Chinese Literature on Educational Theories and Design Principles of MOOCs

Topics	Number of Papers	Percentage
Learning Theories	18	43%
MOOCs Design	16	38%
MOOC Localization or Contextualization	8	19%

Learning Theories

Of the articles researched on MOOC theories and concepts, 43% basically followed the research contents of Western literature. When MOOC-based education had just been introduced in mainland China, many articles explored the theoretical foundation and related concepts of Western MOOCs. For example, Fan (2012) explained connectivism by analyzing 10 MOOC courses and explored differences between cMOOCs and xMOOCs. In recent years, an increasing number of papers in this category have embraced the concept of a "flipping classroom," which means that students finish watching online courses at home and discuss, debate, interact, and practice with teachers and classmates in physical classrooms. Researchers have expressed the belief that such "flipping classrooms" can greatly improve students' productivity and learning performance in China (Xu, Li, & Shi, 2017; Deng, Wang, Li, Yu, & He, 2017; Zeng, et al., 2015; Liu, 2016; Ji, Zhang, Tang, & Liu, 2015; Sun, Z., & Wu, 2015; Zhan, 2016; Hao & Zhang, 2015; Zhu & Zhang, 2015).

Design

Thirty-eight percent of the reviewed papers discussed design-related issues in MOOCs. Most of the papers in this category analyzed design principles and implications based on the practical experience of Western MOOCs. For

example, Wu (2013) used Coursera as an example to analyze pedagogies and design principles of MOOCs. Wu discussed how the MOOC model would affect constructing a cloud learning environment and proposed a cloud learning framework design that works well with MOOCs. In another study, Qian, Wang, and Zhao (2015) used the ChinaX course series on edX as an example to analyze the success factors and strategies for designing MOOCs. In addition, Sun and Zhong (2014) evaluated the peer-assessment model used in a Human Computer Interface course on Coursera. As another example, Wang and Qian (2015) analyzed a MOOC created by Oxford Brook University and explained how this course applied the four principles of MOOC design: aggregation, remixing, repurposing, and feed forward. However, very few papers have discussed instructional design considerations and models specifically for the Chinese audience.

Contextualization

Of the reviewed papers, 19% discussed the contextualization factors of MOOCs in mainland China. Scholars had been aware of the need to combine the current development of information technology with subject characteristics to absorb and accept MOOC-based education into the Chinese education system. Significant attention has been paid on the role and feasibility of MOOC-related

educational practice in mainland China.

For China's educational institutions, MOOC use is a challenging but exciting choice. Some researchers have argued that China should be aware of the risks of cultural colonization by Western MOOCs, and the government should invest in developing more of its own MOOC-based courses and advocate for and disseminate Chinese culture around the world (Xi & Kang, 2016). Absorption of MOOC-related educational practice were gradually proposed in specific subject fields such as ideological and political education.

Some researchers have started reflecting on how to use MOOCs in diverse fields. Liu (2015) proposed that the innovative model presented by MOOCs can help China open universities to promote personalized and diverse learning. Zhang and Xia (2014) proposed that a learning model similar to that offered by MOOCs can be used by the army to provide professional army education, given that the current distance education system for the army is not well-developed. Additionally, much emphasis has been put on the role of the university library in the construction and promotion of MOOC-based education in China.

Comparison of MOOC Design in Western Literature and Chinese Literature

In terms of MOOC design, Western literature has mainly focused on a one-size-fits-all approach to design and structuring the course. Little research

has been done on the design considerations for an audience from diverse cultures or geographic locations.

Comparatively, the Chinese literature on MOOCs has followed the contents in Western literature and not exhibited much in the way of breakthrough. In the relatively short period since MOOCs were introduced to China, scholarly research is still in the exploratory stages. Descriptive and dialectical research is still the mainstream, and the proposed countermeasures and suggestions based on this research are also vacuous and general. In terms of design, few researchers in China have explored instructional design strategies customized for Chinese learners.

Two aspects in the Chinese literature have drawn the researcher's attention:

- Many Chinese scholars have brought up culture invasion as a major concern related to Western MOOCs. Researchers have proposed that the universities and government should invest in developing more MOOCs on ideological and political education, and they have advocated for Chinese culture around the world.
- The flipped classroom is the hotspot of educational research in China. Many researchers have proposed that integrating MOOC and flipped

classroom practice in traditional university courses in mainland China would greatly improve students' learning performance and satisfaction. For example, in a flipped classroom where students have more autonomy in their own pace of learning, the instructor will be able to pay more attention to interaction design, including the types and forms of face-to-face and online interaction, and to prepare optional plans and strategies when unexpected situations emerge during flipped classroom practice.

Survey Results

Survey Responses

The surveys were sent to two study groups on Chinese social media: "MOOCs Study Group" on WeChat (150 members) and "MOOCs China Group" on Tencent QQ (186 members). The target audience of the survey included undergraduate students in mainland China who have taken at least one MOOC from Western universities or organizations. The first two questions on the survey were used as screening questions. Question 1 asked: "Are you currently an undergraduate student in one of the universities in mainland China?" Question 2 asked: "Have you taken at least one MOOC from Western universities or organizations?" The returned surveys that answered "no" to Question 1 or 2 were marked as invalid. Respondents returned a total of 58 valid

surveys. The survey response rate was 17%.

Survey Data Analysis

This section presents a summary of the survey data. The frequency count of all responses for each survey question is analyzed with details and explanations. The charts and detailed data can be found in Appendix 5.

Characteristics of the sample. Responses to survey questions 3 to 6 provided an overview of the participants' demographic information, including gender, university, major, and year in college (see Table 4.3). Of the 58 survey participants, 25 (43.1%) were male, and 33 (56.9%) were female; 35 (60%) students were from top-tier universities[4] such as Peking University, Fudan University, or Harbin Institute of Technology, and 23 (40%) students were from general universities[5] such as Shanxi University of Finance and Economics, Hangzhou Dianzi University, or Guangzhou University.

Among the 58 participants, 13 (22.41%) participants were science majors, 16 (27.59%) were engineering majors, and 29 (50%) participants were liberal arts majors. Additionally, five (8.62%) participants were freshman, 15 (25.86%) were

[4] Chinese universities on the list of Project 985 and Project 211 are usually considered top-tier universities.

[5] General universities refers to the regular universities in China that are not on the list of Project 985 or Project 211.

sophomores, 16 (27.59%) were juniors, and 22 (37.93%) participants were seniors.

Table 4.3

Sample Demographic Information (Gender, University Type, Major, Year in College)

Characteristics	*n*	%
Gender		
Male	25	43.1
Female	33	56.9
Enrolled University		
Top-Tier	35	60.3%
Common University	23	39.7%
Major		
Science	13	22.41
Engineering	16	27.59
Liberal Arts	29	50
Year in College		
Freshman	5	9.38
Sophomore	15	25
Junior	16	28.13
Senior	22	37.5

In summary, the survey participants were undergraduate students in China from a diverse pool of universities. This sample is balanced, including both male and female participants as well as students from diverse majors and different grades.

MOOC experience and drop-out experience. Responses to survey question 7 to 11 provided information on participants' overall MOOC experience, including the subjects of MOOCs that students have taken, where

they heard about MOOCs, what MOOC platforms they have used, the number of Chinese and Western MOOCs that they have taken, and reasons why they dropped out, if applicable.

Question 7 asked the participants about the subjects of the MOOCs that they have taken. The responses showed that liberal arts represent the most popular subject area, followed by math and science. Of 58 responses, 36 (62.07%) participants have taken liberal arts courses; 26 (44.83%) have taken math courses; 18 (31.03%) have taken science courses; nine (15.52%) have taken engineering courses; and seven (12.07%) participants have taken other courses, including management, programming, and finance courses.

Question 8 asked participants to indicate where they had heard about MOOCs. Of the 58 participants, 34 (58.62%) discovered MOOCs by themselves; 11 (18.97%) participants heard about MOOCs from their friends' recommendations; seven (12.07%) heard about MOOCs from their teachers' recommendation; and six (10.34%) participants heard about MOOCs from other channels, including news, television or other media, and parents.

Question 9 asked participants to identify the MOOCs platforms they have used. The responses showed that Coursera is the most widely used Western MOOC platform and icourse163.org is the most widely used Chinese MOOC

platform among the participants. Of the 58 participants, 43 (63.24%) have used Coursera; 31 (53.45%) participants have used icourse163.org; 21 (36.21%) have used edX; 18 (31.03%) have used XuetangX; 15 (25.86%) have used IMOOC; 11 (18.97%) have used Udacity; five (8.62%) have used other MOOC platforms, including Khan Academy and Chaoxing; and four (6.90%) participants have used CNMOOCs.

Question 10 requested that participants indicate how many Chinese MOOCs they have taken. Of the 58 participants, five (8.62%) have not taken any Chinese MOOCs, 22 (37.93%) participants have taken one Chinese MOOC, four (6.9%) participants have taken three Chinese MOOCs, and 13 (22.41%) have taken more than three Chinese MOOCs.

Question 11 queried participants regarding how many MOOCs from Western universities they have taken. Of the participants, 27 (46.55%) have taken one MOOC from Western universities, seven (12.07%) participants have taken two MOOCs, two (3.45%) have taken three MOOCs, and 22 (37.93%) participants have taken more than three MOOCs from Western universities.

Question 12 inquired whether participants have ever dropped out of any Chinese MOOCs and why they did, while Question 13 asked if they have ever dropped out of any Western MOOCs and why. Thirty-six (62.07%) participants

have dropped out of Chinese MOOCs. In comparison, 33 (56.90%) participants have dropped out of Western MOOCs.

Figure 4.1 shows the main reason for dropping out of Chinese MOOCs versus Western MOOCs. The top reason for dropping out of Chinese MOOCs was poor course design. In contrast, the top reason for dropping out of Western MOOCs was the lack of perseverance.

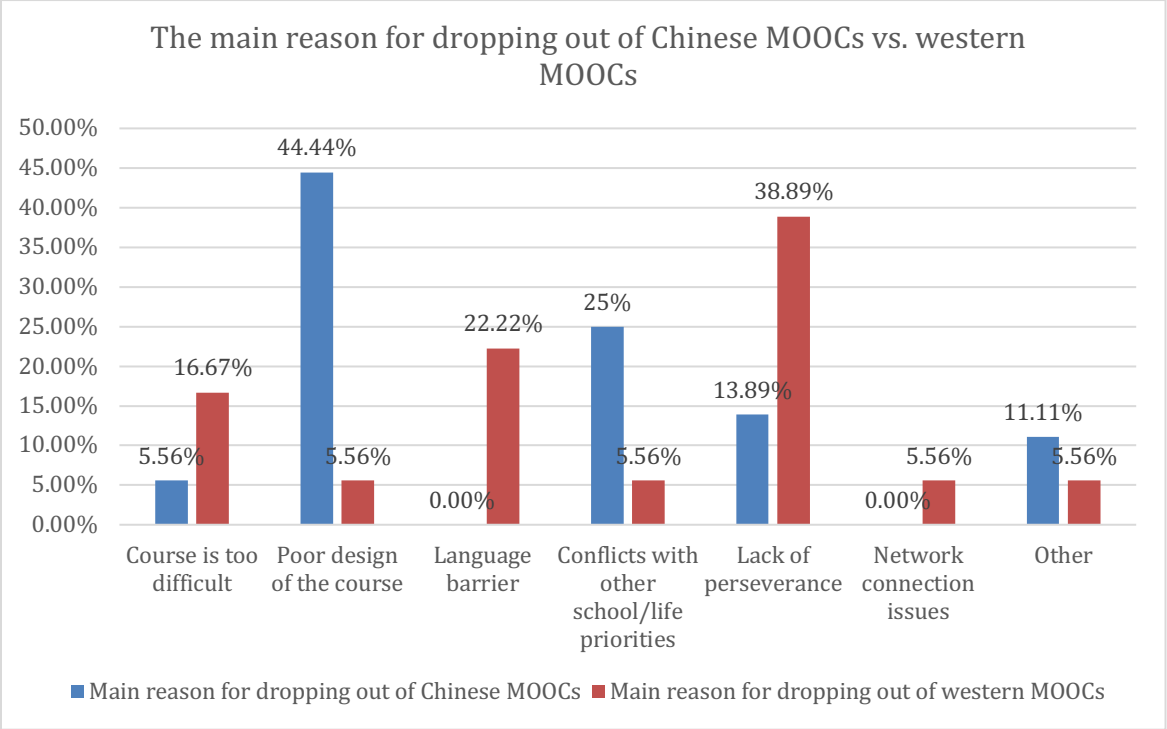


Figure 4.1. Reasons given for dropping out of Chinese and Western MOOCs.

Motivations for taking MOOCs and criteria for choosing MOOCs.

Responses to survey questions 14 to 16 provided information on participants' motivation for participating in MOOCs and criteria for choosing MOOCs.

Question 14 requested participants to identify the primary reasons why they were taking MOOCs. Of the 58 participants, 22 (37.93%) said their main reason was a way to extend their knowledge; 14 (24.14%) asserted the main reason was free access to knowledge; 14 (24.14%) indicated the main reason was higher-quality courses than their universities offered; two (3.45%) noted it was because the course was required by school or teachers; two (3.45%) said they just wanted to experience MOOCs; two (3.45%) reported they take MOOCs because they want to prepare for employment; and two (3.45%) participants indicated other reasons, including peer pressure and course certificates.

Question 15 asked participants about their criteria for choosing which MOOCs to take. Eighteen (31.03%) participants said they chose courses related to their field of study; 11 (18.97%) reported they chose courses from elite universities; 11 (18.97%) noted they chose courses taught by famous professors; 11 (18.97%) participants chose courses covering interesting topics; two (3.45%) participants said they chose courses delivered in Chinese or translated into Chinese; two (3.45%) reported choosing courses that offered certification at completion; and three (5.17%) participants chose other reasons, including all the combined reasons, from elite universities, famous professors, and relevant to my field.

Question 16 (see Figure 4.2) requested participants to define motivating factors for participating in MOOC-based study. Sixteen (27.59%) participants said that acquiring knowledge was the main factor, while 14 (24.14%) chose satisfying personal interests and curiosity. Eleven (18.97%) participants said acquiring job-related skills was the main factor, and nine (15.52 %) noted that acquiring a certificate was the main factor for them. Four (6.90%) participants identified taking personal challenges, two (3.45%) pointed to increasing opportunities for getting employed, and two (3.45%) participants said passing required exams (such as cet 4, college English exam) were the main factors in their consideration. No participant chose "something meaningful to do in my spare time," "entertainment," or "making friends."

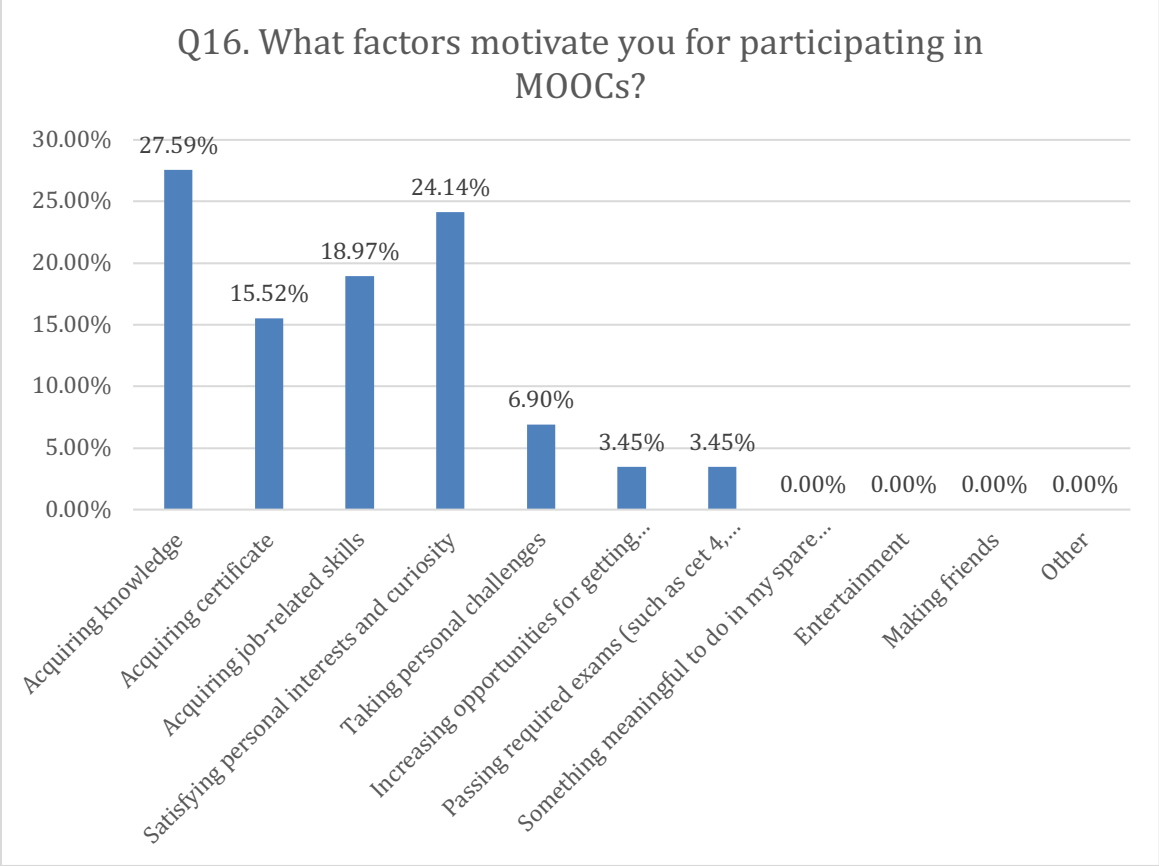


Figure 4.2. Motivating factors in choosing MOOC-based study.

Self-regulated learning factors. Question 17 explored participants' self-regulated learning behavior with MOOCs. The responses of "Completely True" or "Mostly True" were considered positive. The responses of "Completely Not True" or "Mostly Not True" were considered negative. The responses of "Not Sure" were kept for consideration when necessary.

- 57.17% of participants felt positive about the statement, "You evaluate the difficulty of the course before enrolling in it."

- 60.35% of participants reported feeling positive about the statement, "You get basic information about the lectures and instructors before taking the course."
- 58.62% of participants felt positive about the statement, "You make sure you plan and arrange sufficient time for each course you are taking."
- 74.14% of participants noted feeling positive about the statement, "You take notes while watching the videos and reading course-related materials."
- 46.55% of participants showed a positive response to the statement, "You read all the recommended readings in the course."
- 65.52% of participants reported feeling positive about the statement, "You always finish the required assignments on time."
- 36.21% of participants felt positive about the statement, "You look for learning partners during the course."
- 74.14% of participants gave a positive response to the statement, "You spend extra time studying in order to complete the assignments and pass the exam."
- 32.76% of participants felt positive about the statement, "You always actively engage in the discussion on the discussion board."

- 63.8% of participants responded positively to the statement, "You look for help within the course using social media, such as QQ, or discussion forum."

In summary, over 60% of the participants felt positive about the following self-regulated learning behavior:

- "You take notes while watching the videos and reading course-related materials."
- "You spend extra time studying in order to complete the assignments and pass the exam."
- "You look for help with the course using social media, such as QQ, or discussion forum."
- "You always finish the required assignments on time."

On the other hand, fewer than 40% of the participants expressed positive feelings about two activities:

- "You always actively engage in the discussion on the discussion board."
- "You look for learning partners during the course."

Activities and time spent on MOOCs and top three activities. Question 18 requested that participants order the time spent on a variety of MOOC learning activities. Watching course videos received the highest rating, followed

by doing homework and reading course materials. Reading the course wiki received the lowest ratings.

Question 19 asked an open-ended question regarding the top three activities in which the participants preferred spending most of their time in a MOOC course. The top activities that participants indicated included:

- watching course videos/listening to instruction,
- reading course materials,
- taking notes,
- doing homework and labs,
- participating in course discussion,
- reviewing course materials, and
- taking a quiz.

Barriers, support, perceived benefits, and general perceptions. Question 20 asked participants about the barriers they have encountered during MOOC-based study. The responses showed that "Lack of prerequisites," "Having trouble watching the videos," "Lack of time," "Lack of perseverance," and "Lack of feedback from the instructor" were the major barriers that the participants encountered. Of the 58 participants, 10 (17.24%) said the lack of prerequisites was their biggest barrier, while nine (15.52%) participants identified the biggest

barrier as having trouble watching the videos, and nine (15.52%) identified lack of perseverance. In addition, nine (15.52%) participants said that lack of time was the biggest barrier, four (6.9%) participants had trouble uploading the assignments, four (6.90%) participants noted a language barrier, four (6.90%) participants admitted to lack of motivation, none reported lack of interest, two (3.45%) could not find a learning partner, and seven (12.07%) noted lack of feedback from the instructor.

Question 21 asked participants to identify the various support they received during their MOOC-based study. The responses "Completely True" or "Mostly True" were considered positive. The responses "Completely Not True" or "Mostly Not True" were considered negative. The responses of "Not Sure" were kept for consideration when necessary. Of the responses:

- 50% felt positive about the statement, "The instructors or TAs will provide all the support that I need."
- 56.9% expressed positive feelings about the statement, "On the course discussion forum, fellow students will help me with my questions."
- 34.48% responded positively to the statement, "On the external social media groups (such as QQ, WeChat groups), I always get help from fellow students."

- 41.38% said that they felt positive about the statement, "I get more help from external social media groups than the course discussion board."
- 53.45% provided a positive response to the statement, "I get more help from my fellow students than TAs and instructors."

Question 22 requested that participants evaluate the greatest benefits they received by taking MOOC courses. The greatest perceived benefit was gaining knowledge and skills. The least perceived benefits were obtaining recognition from classmates and gaining credits from school. Of the 58 participants, nine (15.52%) indicated that the greatest benefit was to obtain course certificates; four (6.89%) believed that the greatest benefit was helping them pass required exams, such as CET; no participant selected the choice "obtained recognition from classmates"; 34 (58.62%) said the greatest benefit was gained knowledge and skills; two (3.45%) reported the greatest benefit was making new friends; seven (12.07%) indicated that MOOCs improved their self-directed learning; two (3.45%) said MOOCs improved collaborative learning skills; and no students said "gained credits from my school."

Question 23 inquired after participants' general perceptions of taking MOOCs. The responses "Completely True" or "Mostly True" were considered positive. The responses "Completely Not True" or "Mostly Not True" were

considered negative. The "Not Sure" responses were kept for consideration when necessary.

- 81.03% gave a positive response to the statement, "MOOCs provide higher quality courses."
- 37.93% felt positive about the statement, "The tasks and assignments in MOOCs are easier to accomplish."
- 53.45% expressed positive feelings about the statement, "It's easier to obtain the credits or certificates in MOOCs."
- 84.48% responded positively to the statement, "It's easy to learn and use the MOOCs platform."
- 74.14% returned a positive response to the statement, "The assessments in MOOCs are reasonable."
- 84.48% felt positive about the statement, "MOOCs are a good option for learning online."
- 81.03% expressed positive feelings about the statement, "MOOCs are very useful for me so I will decide to continue to take MOOCs."
- 84.48% responded positively to the statement, "I'd highly recommend MOOCs to others."

In summary, over 70% of participants felt positive about the quality and

usefulness of MOOCs and would highly recommend them. The two statements with the least number of positive ratings were: "The tasks and assignments in MOOCs are easier to accomplish" and "It's easier to obtain the credits or certificates in MOOCs."

Question 24 requested that participants provide their own feedback or suggestions for Western MOOCs. A total of 25 students provided comments, falling into the following themes:

- Create more MOOCs in liberal arts subjects.
- Lower the difficulty level of engineering courses since there are too few beginner courses.
- Provide a clearer roadmap of the curriculum (e.g., prerequisites for the course, post-course materials, etc.).
- Add activities that can increase interaction and communication with the instructor and teaching assistants: for example, more office hours or QA sessions. Add Chinese teaching assistants to the courses.
- Improve the quality of the subtitles for the videos.
- Translate more MOOCs into Chinese.

- Integrate MOOC credentialing with university credits so that students do not have to waste time on some lower-quality courses their universities offer.

Summary of Survey Results

The important findings from the survey results are as follows:

- The most popular MOOC subjects for the survey participants were liberal arts.
- The main reasons for dropping out of Chinese and Western MOOCs were very different. As to Chinese MOOCs, instructional design was a major issue. For Western MOOCs, students attributed the major reasons for dropping out to a lack of persistence and the language barrier.
- The participants reported that their primary reasons for taking MOOCs included seeing a course as a way to extend knowledge, free access to knowledge, and access to higher quality courses than their university offered.
- The participants chose MOOCs based on the following major criteria: courses related to their fields of study, courses covering interesting topics, courses from elite universities, and courses taught by famous professors.
- During MOOC-based study, the participants were motivated by the

thought of gaining knowledge, satisfying personal interests and curiosity, acquiring job-related skills, and earning a certificate.

- More participants reported that they took notes, spent extra time studying in order to complete assignments and pass exams, and looked for help regarding the course by using social media while studying for MOOCs. However, fewer participants chose to actively engage in the discussion board and look for learning partners.
- The most popular MOOC learning activities according to the participants included "watching course videos," "reading course materials," "taking notes," and "doing homework and labs."
- The top-rated barriers during MOOC learning included: lack of prerequisites, having trouble watching the videos, lack of time and perseverance, and lack of feedback from the instructor.
- Around half or fewer participants felt positive about the support that they received during their MOOC study, including support from instructors, TAs, peers, discussion board, and social media.
- Most participants would recommend MOOCs to others and gave positive ratings about the quality and usefulness of MOOCs. However, about half of the participants did not agree that "the tasks and assignments in

MOOCs are easier to accomplish" and "it's easier to obtain the credits or certificates in MOOCs."

- The participants' suggestions about how to improve Western MOOCs focused on the following aspects: providing language support, providing more subjects in liberal arts, providing more Chinese teaching assistants, course design considerations such as course prerequisites and difficulty level, and combining MOOC credentialing with university requirements.

Interview Results

Follow-up interviews were conducted in an attempt to obtain more information about the survey responses given in the first part of this study. An invitation email was sent to students who in question 25 of the survey had indicated their willingness to participate in follow-up interviews. Altogether, 18 participants were recruited for the interviews, including 8 males and 10 females from different universities and at different grade levels.

The interviews were conducted through virtual conferencing using the online tools of participants' choice, whether WeChat, Skype, or Tencent QQ. During the interviews, the researcher presented the interview questions on the interview protocol in order, interjecting additional probing questions or

emergent questions as needed. The interviewees provided in-depth responses in interviews that lasted approximately 30–45 minutes apiece. The digitally recorded files were saved to a computer in MP3 format and were transcribed into a Microsoft Word document.

Using the theoretical frameworks in the study—including social presence, community of inquiry, self-regulated learning, and the ARCS model for motivation design—as a basis for coding, the interview documents were analyzed while trying to triangulate data findings from the survey and interviews. The research questions, the theoretical frameworks, and the semistructured interview questions all contributed to the analysis framework for the interviews.

Using the interpretational analysis approach (Patton, 2002), the interview data and the observations were examined iteratively to identify categories and themes that could be used to describe and explain the research questions. More than 60 initial codes were identified and used to categorize the relevant data. Four main themes remained after collapsing the codes into categories or themes.

The following table presents the interview participants' characteristics:

Pseudonym	Gender	Class Year	Age	Major
Lili	F	Senior	21	Liberal Arts
Wei	M	Junior	20	Science
Zhen	F	Freshman	18	Liberal Arts
Xiaoming	M	Senior	22	Liberal Arts
Chi	M	Sophomore	19	Science
Yilin	F	Junior	21	Engineering
Hua	F	Senior	22	Engineering
Xing	F	Senior	21	Science
Zhuzhu	F	Junior	22	Science
Wang	M	Senior	22	Liberal Arts
Chang	M	Sophomore	20	Liberal Arts
Lisha	F	Senior	22	Liberal Arts
Yuan	F	Junior	20	Science
Gang	M	Freshman	19	Engineering
Jie	M	Sophomore	20	Engineering
Lu	F	Junior	21	Science
Tong	F	Senior	22	Engineering
Yang	M	Senior	21	Liberal Arts

The interview participants had taken Western MOOCs on a variety of Western platforms, including Coursera, edX, Udacity, and FutureLearn. Most participants had taken four to six Western MOOCs, and most perceived Coursera as one of the most popular and widely used platforms. In the interviews, participants shared their experiences with various Western MOOC platforms, describing what they had liked and what they had not. Analysis of the results revealed common factors that might contribute to a positive and successful experience using a MOOC as well as common factors that might contribute to a negative and failed experience.

The participants had also taken a wide variety of Chinese MOOCs using Chinese MOOC platforms such as ICourse163, CnMOOC, and IMOOC. During the interview process, participants also shared their experiences with Chinese MOOCs on Chinese MOOC platforms. Participants perceived ICourse163 as the most popular and widely used Chinese platform. Although students' experiences using Chinese MOOCs were not the focus of this research, they did provide context for and further insights into student motivations, course design characteristics, and sociocultural factors that might have influenced students' experiences when taking Western MOOCs.

Most interview participants had encountered MOOCs while engaging in a

virtual online activity, such as browsing Kuokr, taking NetEase open courses, using Zhihu, or participating in social media discussion. Only a few participants had discovered MOOCs through nonvirtual experiences, such as in recommendations from teachers, family members, or friends or through television news, journal, or other types of media coverage.

Various themes emerged from the interviews: (1) motivating factors for course enrollment and completion, (2) self-regulated learning, (3) community of learning, and (4) sociocultural factors contributing to Chinese students' MOOC learning experience. The following sections discuss each theme separately.

Theme #1: Motivating Factors for Course Enrollment and Completion

Based on the interview findings, students' motivating factors for enrolling and completing a course included satisfying interests and curiosity; gaining knowledge and skills; accessing elite universities and famous professors; gaining course certificates; and preparing for exams, employment, and graduate school; other factors were also important, such as course quality, difficulty level, and the like. The following sections explore each subtheme in detail.

Gaining knowledge and skills. Most participants (n = 17) identified gaining knowledge and skills as one of the most important factors motivating them to take MOOCs. They described themselves as being motivated to learn

new things that they could use immediately. Tong shared her perspective on how gaining useful knowledge and skills had motivated her to complete MOOCs:

> The courses that I completed were the ones that could bring me immediate benefits, something I could use immediately. This probably sounds very utilitarian . . . . But this is the fact [*laughter*] . . . right, that's what motivated me . . . . For example, at one time, I enrolled in some psychology course that sounded very interesting, but once I was in there, I found out it was too theoretical, nothing that I could use in real life; then I had to give up. Just like if someone just wants to be a cook and you try to teach molecul[ar] biology, how could that person not give up?

Conversely, Xiaoming shared his experience taking a very useful MOOC, describing how he had applied what he learned from the course to real life:

> When I looked back at the process of studying "Buddhism and modern psychology," it felt like a spiritual journey! The fundamental [concept] of Buddhism is introspection, also so-called meditation, which became so popular in recent years. I learned to spend about 10 minutes every day to focus on examining my own emotions, thought, and attitudes from external perspectives, calm myself down, and reflect on [a] clear reality. This made m[e] more focused [so that I was able to] resist external interruption during my study . . . even at most stressful time, like during final exam, and keep my mental strength. I got [a score of] 96.7 from peer review and also read a lot of articles on psychology and Buddhism. [This course] helped me so much . . . not only for my study . . . but also for my future life.

Lili shared a similar experience:

> I took "Learning How to Learn" from Coursera. It's the best course I've ever taken in my life. It's so useful; it has changed my life so dramatically . . . . I improved my learning habits and I think I was able to

> learn more effectively after taking the course. For example, I'm still applying the Pomodoro techniques that I learned from the course to my daily life. I was able to finish [the course] because it's really, really, really helpful.

Tong, who is in his final year of college, shared how what he learned from MOOCs prepared him to get a job:

> As to the biggest impact, MOOC learning gave me the opportunity to get a job offer during my senior year. Although I followed Coursera very early on . . . the first MOOC course that I completed was "Machine Learning Cornerstone." I started to learn machine learning systematically, not as . . . I did before—learning from random sources. I also would like to say I'm very thankful for such a great course with a very strong theoretical foundation. Without the depth of knowledge, if it's just some superficial knowledge, it would be very difficult [for me] to be eligible to get an offer. I also learned [from the] "Critical Thinking" course, but the potential value of this course is more difficult to measure: When I ran into some problems later on, the way of thinking that I learned from this course often played a role and helped me [come up with solutions]. Then I went on to learn the intro of [Andrew] Ng's machine learning course, [the] "Intro to Data Science" course from UW. When I interviewed with my dream company recently, the interviewer asked me to go over the knowledge I had learned. At that time, I didn't know many algorithms; all I knew were from the machine learning cornerstone course and Ng's machine learning course. But because these courses gave me a very good foundation of knowledge, I finally got the offer.

For students in lower grades, a major motivation was having the chance to take courses that were better than those their universities could offer. A few interview participants also mentioned learning English as an important factor in their taking Western MOOCs.

One student, Jie, commented on how MOOCs helped him get through a boring course offered by his university:

> You won't be able to believe how boring the linear algebra course was from my university. If it were not [for] the MOOC that I took from MIT, I would just have failed [the course from my university]!

Satisfying interests and curiosity. Most of the participants (n = 15) emphasized how interests and curiosity had played a role in their selection of and study in a MOOC. Wang, for example, shared how personal interests had affected his MOOC learning experience:

> The most critical thing is interest. For example, I studied the "Roman Architecture" course on Coursera. The reason why I took it because I was preparing for a trip to Turkey during the next national holiday. My mom told me to do some research before the trip and be the tour guide for our family. In addition to planning for travel details, I was trying to learn something about the social, culture, history of the country . . . that's important. I first reviewed *Anatolia Story*, my favorite Japanese comic book [and] also bought *The History of the Decline and Fall of the Roman Empire*. Of course, I didn't finish, because . . . you know, too much reading. I also bought some books about the Ottoman Empire, also I found the Quran that I bought during a previous trip to the northwest region in China. I tried to read it but just couldn't . . . I had to give up. Eventually, I discovered the "Roman Architecture" course on Coursera. I spent 4 weeks digging into the course. I watched all the videos, made notes, and did a lot of extra reading . . . . I did all of that because it was a topic I was super-interested in . . . because . . . it's like . . . imagine when we see a piece of very beautiful architecture in Turkey, I would to be able to tell my family and others, "Look, this is Baroque style, and blah, blah, blah . . . ." How cool would that be!

In addition, a few participants indicated that learning through a MOOC is a very rewarding experience if doing so fulfills their curiosity. They also shared how their passions and interests helped them overcome challenges in the learning process. Wei shared his experience:

> I took the "Introduction to Astronomy" [course] on Coursera. I read a novel called *The Throne of Magical Arcana*, which used some physics theories as the foundation for the magic, brilliant plot. I got so interested in quantum physics since then. After reading the book *History of Quantum Physics*, I started looking for online courses that were relevant. It was totally random when I discovered it ["Introduction to Astronomy"] on Coursera. But for an amateur like me, this course was very, very difficult . . . . I spent a few hours every day watching the video clips, did extra readings, searched for materials online, took notes—I spent almost all my spare time on this course. Another reason is that I started the course 1 month late, I had to learn 2 week[s' worth of] materials in 1 week. It was getting harder and harder, especially near the end—the homework from week 10 almost drove me crazy. However, this was a very rewarding experience: Every time when I learned something new, theories and knowledge that I never heard about before, I always felt "wow, how amazing the world is." I felt that my curiosity was satisfied. My passion kept me going further and further. I think when people dropped out of something, it was simply because they didn't love [the subject] enough.

Some participants (n = 5) indicated that they had dropped out of courses because they were not interested in the subject any more. For example, Xing said

> I didn't finish [the course] because I couldn't find pleasure in it any more. Just like an old Chinese saying: Those who know are not as good as those who would like to learn, and those who would like to learn are not as good as those who enjoy learning. I took MOOCs based on my interest, and just the[n] for fun.

Most participants (n = 15) showed strong interests in liberal arts subjects, although these were not related to their major. They indicated various reasons for their interest in these subjects, whether in response to the limited resources in their current university or Chinese educational system or because they loved to learn Western perspectives:

> [I'm interested in liberal arts MOOCs because] I couldn't find similar courses in my university. Even if there are similar courses, the quality [of those courses is] not comparable.

Lu shared a similar experience of taking a justice MOOC from Harvard University:

> One of the best courses I took is "Justice" by . . . a professor from Harvard . . . . His name I think is Michael Sandel? It was a couple of years ago. It was an eye-opening experience for me. It was a course about moral reasoning and political philosophy. You know, China and the U.S. have very distinct political systems. Philosophical foundations are different too . . . . A Chinese student could rarely see a course like this unless [Western politics or philosophy is] related to your major, you are studying abroad, or [you are] doing your own research in this field . . . . When I watched the first video for a few minutes, I just fell in love with it immediately. The topic is so intriguing! I got exposed to books from Aristotle [and] John Locke for the first time in my life. The instructor is amazing—he encouraged reasoning and questioning [and] provoked a new way of seeing controvers[ial] issues. You know, what our education system taught us was that there is only one way, one right answer. But that's probably not true. This course just changed my view on everything—literarily on everything. Wow, just unbelievable!

A few participants (n = 5) also mentioned that they were interested in learning Western perspectives. Lili shared that she took the China series course from Harvard because she was interested in exploring the Western perspective:

> I really like ChinaX series from Harvard—I'd like to know how Westerners think about China.

Access to elite universities and famous professors. More than half of the participants (n = 11) mentioned their experience with courses from elite Western universities such as Harvard, MIT, and Stanford, as well as with famous professors. They appreciated the rich learning opportunities that MOOC brought them, as Zhen noted:

> MOOC is the best thing that ever got invented! Without MOOCs, people like me probably would never to be able to access courses from the best universities in the world.

Gaining course certificates. Most participants stated that completing MOOCs gave them a sense of achievement. However, most participants indicated that gaining a course certificate was not their major goal in taking MOOCs, considering that MOOC certificates haven't achieved a level of credibility valued by employers or graduate school admission offices. A few participants stated that they hoped MOOC certificates would give them extra credits in the future by showing their dedication to and passion for learning.

Quality and difficulty of courses. The perceived quality of MOOCs and difficulty level of these courses were also important motivators for course completion or dropout.

Participants (n = 16) reported that Western MOOCs are usually high-quality courses. Xing said,

> Actually, if you were really serious about it and had been consistently studying for a couple of semesters, it would be like taking regular courses from a university. And actually, some [Western MOOCs] were [of] a much higher quality than some mediocre courses in my university!

On the contrary, most participants (n = 13) reported that Chinese MOOCs were usually of a lower quality. Hua said,

> [most Western MOOCs are] very high-quality, better courses tha[n] what my university offered . . . . But I just couldn't stand most of the Chinese MOOCs, too boring . . .

A few students (n = 5) dropped out of courses because the courses were too difficult or because they didn't have the necessary prerequisite knowledge. Hua said,

> The most difficult course that I took, the one that I had to drop eventually, [was] the "Asset Pricing" course from the University of Chicago. I heard that it was the original PhD course [offered by the university, using] the original video recordings from the classroom, [but] a lot of fundamental knowledge [was] just skipped [in the course]. It probably [was] not that difficult for PhD students in this major; however, to me, it was [too difficult]: I didn't have time to study, and it was too bad that I had to give up.

Zhuzhu also shared a similar perspective:

> The courses that I finished were not too difficult or too easy. That's important. Otherwise, I usually gave up, if it was too difficult, or got so bored that I had to quit, if it was too easy.

Theme #2: Self-Regulated Learning

Time management. Lack of time was the barrier most frequently mentioned by participants. Hua shared her experience managing time for MOOC study:

> Every week I studied about 6 hours, including watching videos and reading course materials—although [there was] not much homework, only two essays. But for someone like, working on my internship and [in my] final semester, it was really a challenge to manage time. One time I went on a trip and [when] I got back, I [had] missed 1 week [of] study, so I had to spend the following week studying 2 week[s' worth of] materials. It was [a] really painful experience. In summary, I think the key is [to] try your best to be on track or a little bit ahead of the schedule—don't delay until the last minute.

Zhen shared about how she had failed a MOOC course due to conflicts with other priorities:

> There were about six videos to watch every week. The instructor was super-good. I took notes while watching the videos. But eventually I didn't finish, because around the time that the second homework was due, I was busy with my midterm exam at my university—a lot of homework [was] piled up. It was extremely difficult to find time to do the homework from Coursera. So I didn't hand in that homework, and then during the final exam period at school, the situation got even worse. I was so buried with my existing coursework. In the end, I had to drop out of the course from Coursera.

Chi stated that procrastination was the main factor why he had dropped out of MOOCs:

> Procrastination it is [the biggest enemy]. I sometime delayed homework until the last minute. When I went further in the study, I just realized that I needed to spend much more time and energy than expected, or I didn't have enough pre-knowledge.

A few participants (n = 5) also shared the strategies they used to manage time more efficiently, such as the Pomodoro technique or time management apps on their mobile phones.

Diligence and perseverance. All participants (n = 18) emphasized the importance of diligence and perseverance when learning through MOOCs:

> In fact, persistence is probably not that hard. Listening [to] the videos only took about one hour, but digesting the videos probably need[ed] half a day. If you didn't finish your own coursework, it would be really hard to do online courses. After all, there are homework and assessments from the courses on Coursera. You'll need to make some commitment. You must follow the progress [and] have enough time and energy to absorb the knowledge.

A few participants (n = 8) blamed themselves for dropping out of courses due to the lack of effort and strategies. For example, Yilin said,

> If I summarize why I failed or dropped out, there were just two reasons—my own laziness and stupidity.

Hua shared her story of surviving a course by making a great effort:

> You must be able to survive some key moment. What I meant is when

> you have a conflict, [such as when] the deadline is coming up and you are busy with something else, you must stick to your plan and cannot give up. When my mom got sick and needed a procedure at one time, it was about the same time as my last two quizzes and final exam for one of the MOOCs that I was taking. I didn't have time for the corresponding two chapters and videos. Because I didn't want to waste the course that I ha[d] worked on for 2 months, when I was in hospital accompanying my mom, I still used iPad and headphones to watch the course, and at night I studied in the hallway of the hospital until 3 a.m., doing homework and taking the quizzes. I finally passed the course with [a score of] 94. I think you just persist and never give up.

Learning strategies. For most participants (n = 13), taking notes was one of the important learning strategies. The participants (n = 8) also put a lot of emphasis on the value of quizzes and exams in their process of learning.

Most participants (n = 10) also shared that it was not easy to find a learning partner online. Tong shared her experience and strategy of finding a learning partner offline:

> When I studied machine learning techniques, I combined learning online and offline. When I was studying [for] this course, I was having an internship. This course was very challenging for an undergraduate who majored in engineering. But a colleague from my [internship] team is a student from Nanjing University. His major was in this area, and his advisor was famous in this area. I often asked him for advice [*laughter*], so the study of this course was very enjoyable . . . . Every day after work, I spent time studying this course, either [at] the company or [when riding] back to where I live. If there was something I didn't quite understand, I would watch the video repeatedly and as[k] my colleague for advice. He would recommend some information to read in depth, and occasionally we chatted [about] how to apply what we learned from this course to real work scenarios. The learning experience was a blast.

Lisha shared a similar experience of finding learning partners:

> As to several other courses, such as learning [in] Ng's class, I found a few learning partners in school to study together [with]. We built a group and will discuss and share useful information. After all, Ng's curriculum is relatively easy, not including much theoretical analysis. So if you can find someone to take a course together with you, you'll have a more enjoyable experience, because you are not alone in the journey; and as to any problem, as [long] as you do not violate [the school's] honor code, you [have] someone [with whom] to discuss the solution. I think the most reasonable way of MOOC learning is to enable online and offline integration—online learning led [to] offline learning, and offline learning enhanced the learning effect.

Theme #3: Community of Learning

Teaching presence and course design. The instructors in many of the Western MOOCs were perceived as knowledgeable, humorous, personable, and passionate about teaching. Although the instructors appeared only on videos and had a limited degree of interaction with their students, the students felt connected with them immediately after watching the videos and were motivated to continue with the course.

Teaching assistants usually served as course facilitators. However, the support and help received from teaching assistants varied for different courses and platforms. Most students (n = 12) said it was not very common to get timely feedback from TAs. However, when courses featured excellent TAs, students usually had a more positive perception of the learning experience and a higher

chance of completion.

Video quality was one of the important factors that influenced the participants' learning experience. Most of the participants (n = 12) thought that edX courses usually offered much higher-quality videos than were found on other platforms. Other course design elements were also considered critical elements influencing students' learning experience. For example, personalized email communications from member of staff, course reminders, new course recommendations, and use of an autograder for assessments contributed to a positive learning experience, whereas lack of guidance on course prerequisites or of suggestions for subsequent courses led to a bad learning experience.

Most students (n = 13) stated that the teaching quality of Chinese MOOCs needed to be improved. Zhuzhu said,

> Once I was able to access YouTube and watch the course videos [from Western MOOCs], I finally gave up on the Chinese MOOCs . . . because [the Chinese MOOCs] were so boring [and I] felt like the teachers were just reading PowerPoints. I hate it!

Another student, Yuan, shared similar a perspective:

> Only two (Chinese MOOCs) I took were [of] high quality: "Financial Analysis and Decision Making" and "Literature Management and Information Analysis" by TsingHua University . . . . The rest were just terrible . . . .

Social presence. Most participants (n = 15) stated that they felt isolated during the learning process. A few participants (n = 5) shared their frustration trying to find a learner partner in the course, which led to a negative learning experience. Some participants attributed their failure to a lack of interaction with fellow students and instructors. Gang, for example, said,

> One time I was trying to finish a course about computer fundamentals, I had been waiting for peer review in order to pass the course; however, I had been waiting and waiting for so long, [and] even asked for help on the discussion forum, [but] nobody gave me a review. So in the end I failed the course.

Wang shared a similar perspective on the importance of interaction:

> I think the lack of motivation was because it was so easy to give up when you were studying alone; also, you couldn't ask a question to anybody. You couldn't communicate with the teachers in the videos. The fact that you couldn't solve the difficulties in the learning process resulted in quitting. Personally, I think for every course, there should be a real-time discussion board—you could see who [was] online the same time as you, [and] you could raise a question to anyone you want[ed] to. Through more collaboration and discussion, students could help each other, and they would develop friendship and partnership during the learning process.

All interview participants stated that they would love to have more interaction with other students, teaching assistants, and the instructors. Xiaoming shared his perspectives on how peer review contributed value to his learning:

> The evaluation system on Coursera is peer review, which means the final score is not given by the professor; instead, it's given by your classmates.

> [Your classmates] would also provide feedback and suggestions. For example, the score for each of my assignments came from the average score given by my two classmates. The average score of two assignments is my final score for this course. I had to admit in the beginning I doubted the values of peer review feedback. You know, as Chinese students, teachers always had the highest authority. It's not an evaluation method we were familiar with. However, I gradually understood the advantages of this evaluation system. For example, for each of my assignments, I would receive very long feedback from two of my classmates. Based on their feedback, I started to reevaluate my understanding for certain problems. Correspondingly, I would also need to review at least two classmates' homework and g[i]ve them my evaluation and suggestions. I really enjoyed reading other students' thoughts and reflections and providing helpful feedback. During this process, my abilities of critical thinking and logical thinking and analytical skills were all improved greatly.

Theme #4: Sociocultural Factors

The interview findings also identified the following sociocultural factors that affected participants' learning experience when taking Western MOOCs.

Language issues. More than half the participants indicated that they encountered a language barrier during MOOC learning. For example, Lu said,

> although I knew every word in the video, I still had to replay the video for a couple of times [in order to understand it] . . . and this is a subject I know well. It drove me crazy.

Zhen shared her experience of overcoming language barriers as well as psychological barriers:

> It's like practicing English. At first, the lectures all had English and Chinese subtitles. Although I enabled the subtitles, I didn't think that I

> needed them at all. However, at almost halfway through the course, all the subtitles were gone. I started to realize that something went wrong—I'm having trouble understanding it . . . . Then I felt very sad . . . but at that point, I had watched almost 20 videos; how could I give up at this point? Then I continued no matter what. After a couple of days, I felt my English improved a lot. I think I eventually overcame some kind of psychological barrier.

Chi shared a frustrating experience with a course due to the lack of language support:

> [W]hen the course became available, I downloaded all the course videos to my local hard drive and then realized that there were no Chinese subtitles. I had to pause the video so many times, [and I] looked up [words in] the dictionary millions of times too. Finally I converted the [English] subtitles to text, spent 1 week putting all the subtitles in a Word document, 50 page[s] long, [and] then I printed it out. I was almost moved by my own determination and effort . . . [*laughter*] . . . . However, the course ended again before I could go to the second module. Then I gave up, because for some very long, professional, tedious terms, I couldn't even find them in the dictionary! I think I probably should focus on writing an article instead of looking up the new words in [the] dictionary. Then I enrolled in the course for the third time. I thought I had spent so much time and effort on this course, if I didn't finish and had no certificate to show in the end, what a waste this would be! Then instead of watching the videos, I started with quiz questions first and played with the answers and eventually got a passing score. However, the only thing I learned from the course was the first module, where I looked up all the English words.

It was also surprising to find out that students from elite universities in China or students who majored in English would also need some sort of

language support and help, such as having subtitles provided in both English and Chinese.

Technical issues. More than half the interview participants stated that technical issues were a major barrier to their MOOC study. Internet speed was often an issue. When mainland China's Internet firewall blocked many websites or videos from Western countries, students invented workarounds: Many used virtual private networks to bypass Internet censorship by doing what they described as "climbing over the wall." Lisha, for example, shared that

> it was so hard for me to get the certificate [for the] "Introduction to Psychology" course on open2study. The first time when I enrolled, I didn't know how to "climb over the wall"—none of the videos could be played correctly. When I finally figured out how to do it, the course was over.

Sociocultural factors. Certain sociocultural factors also reduced participation on course forum or other activities. For example, Chang said,

> I'm usually spending more time writing a post on the discussion board . . . not only because of my English skills . . . . I'm just trying to be polite and don't want anyone to misunderstand me; I would hate to offend anyone . . . . This is very different from how I participated in a discussion on a Chinese forum or Chinese social media group.

Many participants (n = 10) also shared their experience of not feeling welcome in the course or of not belonging to the group. Gang said,

> I didn't say much on the discussion board, because I didn't know what to say . . . [I participated] only when I urgently needed help or participation was required [by the course]. I didn't feel very comfortable. There were very few Chinese students in the class . . . . Yes, I usually felt excited when I saw a fellow Chinese student introduc[e] himself/herself on the discussion board. I would tend to reply their posts more often.

Summary of Interview Results

The interview participants, a small subset of the survey participants, included both male and female participants and students from diverse universities, majors, and grade levels. The analysis of the results revealed a commonality of experience among these undergraduate learners.

The interview findings resulted in four major themes: (1) motivating factors for course enrollment and completion, (2) self-regulated learning, (3) community of inquiry, and (4) sociocultural factors. These findings further validated and triangulated the survey results and provided a more holistic picture of students' actual experience.

Chapter 5: Discussion and Implications

The aim of this chapter is to discuss the results from the document analysis, surveys, and interviews and to provide implications for how to support the learning experience of Chinese students and improve the design of MOOCs for this particular audience.

Section 5.1 features a discussion of results from a comparison of Western and Chinese literature on MOOCs and explores suggestions in the existing literature about how to localize and contextualize these courses for a Chinese audience. The following research questions are answered:

- RQ1: What educational theories and design principles guide the design of Western MOOCs?
- RQ2: What educational theories and design principles guide the design of MOOCs in China?
- RQ3: What are the differences and similarities between the educational theories and design principles that guide the design of MOOCs in China and Western countries?

Section 5.2 offers an appraisal of the results from surveys and interviews regarding Chinese students' actual experience of taking Western MOOCs. The following research question is answered:

- RQ4: What are Chinese students' learning experiences while taking Western MOOCs?

Section 5.3 provides an analysis of the results garnered during the previous stages and combines data from the document analysis, interviews, and surveys. The final research question is answered:

- RQ5: To accommodate socio-cultural differences in learning, how should Western instructional designers design MOOCs for Chinese students?

Section 5.4 gives a conclusion to this chapter by addressing the limitations of the study.

5.1 Results of Document Analysis

Western literature covers theories relevant to MOOCs, design considerations particular to these courses (e.g., learner characteristics, the structure of the courses, and assessment in the MOOC environment), technological considerations, and instructional design models. Such writing is mainly focused on a one-size-fits-all approach to designing and structuring courses and has not addressed design considerations for audiences from diverse cultures or geographic locations.

Similarly, the Chinese literature on MOOCs has followed the trends seen in Western literature. Chinese scholars' research remains focused on exploratory, descriptive, and dialectical tactics. Few of them have explored instructional design strategies customized for Chinese learners.

In terms of differences between the Western and Chinese literature, culture invasion is a major concern that many Chinese scholars have highlighted since MOOCs originated in Western countries. By "culture invasion," these researchers mean that the popularity of Western MOOCs, especially in Liberal Arts topics, may cause the Chinese cultural identity to fade incrementally under the influence of an "alien" culture from the west. Chinese scholars have also proposed approaches to cultural protection in China against the backdrop of globalization; for example, advocating that more Chinese MOOCs, which emphasize Chinese culture and ideology, should be created.

Additionally, the concept of the flipped classroom is a hot topic for educational research in China. Many authors have asserted that flipped classroom practice, in traditional university courses in mainland China, would greatly improve students' learning performance and satisfaction (Xu, Li, & Shi, 2017; Deng, Wang, Li, Yu, & He, 2017; Zeng et al., 2015; Liu, 2016). These researchers believe that integration of the flipped classroom approach with

MOOCs can help maximize the advantages of both learning models (Hao & Zhang, 2015; Zhu & Zhang, 2015). This would mean that lectures would take place outside of class through the MOOCs, while class time would be spent on active work and interactions with instructors and other learners. When students take MOOCs outside of class, they control their own pace of learning and can reflect on what is being said, rewind to hear it again, listen to as much or as little of the lecture as their schedules permit, and watch course videos on a mobile device rather than in a fixed location. By the same token, in class, students can concentrate on internalizing the material with the help of their peers and instructors. Instruction can be personalized to each student in that instructors, instead of presenting a one-size-fits-all lecture to an entire class, can adopt the role of a "guide on the side" rather than a "sage on the stage." The integrated model, when used in a Chinese classroom, can thus lead to a more inclusive and active learning experience than that offered through a traditional approach to learning (Ji, Zhang, Tang, & Liu, 2015; Sun & Wu, 2015; Zhan, 2016).

5.2 Results of Surveys and Interviews

The data analysis of survey responses and interviews resulted in the identification of four major themes: motivational factors, self-regulated learning strategies, community of learning, and socio-cultural factors. The following

sections provide a summary of these themes and an explanation through a lens of the major conceptual frameworks for this study: motivational design, self-regulated learning theory, Community of Inquiry (CoI), belongingness, and Social Identity Threat.

Motivation

Keller's (2010) ARCS model was used as a conceptual framework with which to analyze the motivational factors for Chinese students in a Western MOOC learning environment. This model, as shown in Table 5, includes four categories of learner motivation: attention, relevance, confidence, and satisfaction. Each category has subcategories that are supported by specific psychological constructs.

Table 5

Categories of Learner Motivation in the ARCS Model

ARCS Categories			
Attention	Relevance	Confidence	Satisfaction
A1 Perceptual arousal	R1 Goal orientation	C1 Learning requirements	S1 Intrinsic reinforcement
A2 Inquiry arousal	R2 Motive matching	C2 Success opportunities	S2 Extrinsic rewards
A3 Variability	R3 Familiarity	C3 Personal control	S3 Equity

Based on the triangulated results from the survey and interviews, the major driving forces behind the Chinese participants' enrolment in and completion of Western MOOCs fell into specific categories in the ARCS model.

Attention. First, the data analysis of surveys and interviews led to an identification that motivational factors related to attention in the ARCS model were the most important for Chinese students. Western MOOCs have successfully gained much interest and attention from Chinese students, for the following reasons:

- Most participants were attracted by courses from elite Western universities or that were taught by famous professors. While devising

courses, instructional designers should take into consideration that featuring renowned professors will most likely increase course enrolments.

- Most participants were curious about Western educational systems and interested in learning about Western culture and its perspectives on a range of subjects, which contradicts the "cultural invasion" concerns raised by the writers of Chinese literature. As such, instructional designers of Western MOOCs should not be concerned about providing Westernized content or using Westernized pedagogy.
- Most participants were driven to take certain Western MOOCs because these courses were able to satisfy their curiosity over, and interest in, certain subjects.
- No matter their major, most participants were particularly interested in high-quality MOOCs on liberal arts subjects because their universities, or the Chinese educational system in general, offered limited resources on these subjects. MOOC providers should therefore offer more Liberal Arts subjects and systematically design and create complete programs in this field, based on the high demand for, and popularity of, these courses among Chinese students.

Relevance. The study results also indicated that relevance is another important motivational factor behind Chinese students' enrolment in and completion of courses. Most respondents mentioned that they selected courses that were most relevant to their needs and matched their learning objectives. For example, one participant stated that he took the "Learning How to Learn" course because he wanted to improve his learning habits and methods; meanwhile, another denoted that he took the Linear Algebra course on edX because he struggled to understand the same subject when it was offered by his university. Instructional designers of MOOCs should clearly define and outline the courses' learning objectives and ensure that all the course elements and learning activities are closely aligned with the course objectives.

Confidence. The data analysis also revealed motivational factors related to confidence. Many participants stated that they occasionally dropped out of courses because they were too difficult or did not appear to be a good fit for their knowledge and skill level. A few students shared examples about losing confidence in their ability to finish a course; for example, they became totally discouraged when they encountered a significantly difficult learning task or missed an assignment that required too much time or a heavy workload. Instructional designers should always keep the correct audience in mind when

designing courses and ensure that course prerequisites are clearly explained at the outset of the course. In addition, the assignment types and difficulty level must be appropriate to the audience and the online MOOC learning environment.

Satisfaction. Motivational factors related to satisfaction in the ARCS model were also found to be important to the Chinese respondents. Both the survey and interview results showed a very high satisfaction level with Western MOOCs, according to the participants' ratings. Some said that MOOCs were the "best thing that ever got invented" and it was "such a blessing" to have access to Western MOOCs.

Both intrinsic reinforcement and extrinsic rewards were identified in the analysis.

Intrinsic reinforcement. Participants shared that the courses they completed were those that they could apply to the real world to gain immediate benefits. Many respondents who were in their junior or senior years confided that they were particularly interested in gaining knowledge and skills that could be applied to both their internships and real work scenarios; they were also keen to gain soft skills that would help them achieve future success. A few also articulated that their goal in taking Western MOOCs was to improve their

English skills.

Extrinsic reinforcement. The extrinsic rewards for the participants were summarized as being the following factors: passing exams, gaining a sense of achievement, and gaining course certificates.

- Exams: To some participants, MOOCs were better substitutes for the courses offered by their own universities and helped them get through these difficult or boring courses as well as pass exams.
- Achievement: Most stated that completing MOOCs gave them a sense of achievement.
- Course certificate: Most indicated that gaining course certificates was not their major goal in taking MOOCs, given that the certificates have not garnered the credibility that is valued by employers or graduate school admissions offices. That said, a few participants stated that they hoped the certificates would give them additional credits in the future, which would reflect their dedication and passion for learning.

To motivate learners to complete courses, instructional designers of MOOCs should come up with more creative reward strategies, such as the offering of badges and a points system. For example, Khan Academy offers a series of badges to students upon completion of learning activities, including

moon badges, earth badges, sun badges, and so on. In addition, Western MOOC providers should partner with Chinese universities to offer course credits for Chinese students so that the latter do not have to waste their time retaking the same courses.

Self-Regulated Learning

Pintrich's (1999) model of self-regulated learning was used as a conceptual framework with which to analyze the participants' self-regulated behaviors and strategies for Western MOOCs. Self-regulated learning is an active, constructive, and goal-directed process whereby learners monitor, regulate, and control their cognition, motivation, emotions, and behavior, guided and constrained by their goals and the contextual features of the environment (Pintrich, 2000).

Pintrich (2000) identified three categories of self-regulated learning strategies that students should apply to regulate their learning: cognitive, metacognitive, and resource management. The participants' self-regulated learning strategies, applied when taking Western MOOCs, were analyzed based on these categories.

Cognitive strategies. This term refers to activities performed by learners in their acquisition, storage, and retrieval of information.

Both the survey and interview results showed that note-taking was one of

the most important learning strategies that participants reported as having applied.

Most respondents also placed significant emphasis on taking quizzes and passing exams, although gaining course certificates was not their main goal in taking Western MOOCs. Many stated that taking quizzes was a great way to obtain feedback so that they knew what areas to improve. Because some platforms, like Coursera, allow students to attempt quiz questions multiple times, some participants said that they tended to repeat certain questions until they earned perfect scores, as a result of their "perfectionist nature" and learning habits.

This analysis confirmed the findings of a recent study whose authors investigated MOOC learner behaviors by country and culture: Students from countries with higher power distance and lower individualism, such as China, are more likely to focus on evaluations (Liu et al., 2016). In order to be more inclusive of Chinese students, instructional designers should bear their preferred learning styles in mind. Constant knowledge checks or quizzes would be helpful in keeping these students focused and create a more effective learning experience.

Metacognitive strategies. This term refers to activities used by learners when monitoring and reflecting on their learning process to accomplish a goal. Only about half of participants indicated that they implemented metacognitive strategies in their MOOC learning, such as evaluating the difficulty of the course before enrolling in it; getting basic information about the lectures and instructors before taking the course; and planning and arranging sufficient time for each course taken. To improve their learning experience, students need to learn to integrate metacognitive strategies into their learning process. Instructional designers should provide clear guidance on the required learning activities, time needed for each activity, and difficulty level of the course on the syllabus or orientation materials prior to the start of the course.

Resource management strategies. This term refers to activities used by students to manage their time, study environments, and the resources provided.

Most participants stated that lack of time was a major barrier to learning. Some shared their strategies for time management, such as the use of Pomodoro techniques or self-control mobile apps that prevent them from browsing online or using a cell phone.

Very few respondents stated that they actively engaged in the discussions on the message board or that they looked for learning partners during the course.

Instructional designers should provide students with tips on how to manage time and how to best use course resources before the commencement of the course.

Community of Learning

The Community of Inquiry (CoI) framework was employed to analyze the participants' learning experience with Western MOOCs. This framework deconstructs online instructional environments through the interaction of three components: social presence, teaching presence, and cognitive presence (Garrison, 2007). The interplay of these three elements creates the online experience and is helpful in describing the learning experience.

For the purpose of this study, the participants' experience with Western MOOCs will be explained through the lens of social and teaching presence.

Social presence. This term represents the degree to which participants identify with, and feel connected to, each other in an online environment (Garrison, 2011).

The data analysis from the survey and interview results showed that in most cases, participants experienced limited social presence, including open communication, affective expression, or group cohesion, during their MOOC learning experience. Most confided that they felt isolated during the learning

process. A few shared frustrating experiences related to finding a learner partner in the course, which led to a negative learning experience. Some respondents attributed their failure to a lack of interaction with fellow students and instructors.

All participants related that they would love to have more interaction with other students, teaching assistants, and instructors. Most reported feeling more comfortable with the use of social media, such as QQ or WeChat study groups, to participate in the discussion or ask for help from other Chinese students who had enrolled in the same courses. A few participants shared about rare cases in which social presence was adequately integrated into their MOOC learning experience. For example, they were assigned to groups based on their knowledge level, interests, and preferences, worked closely with their group, and took full part in group activities, which engendered a more beneficial learning experience.

These findings are consistent with Garrison's (2000) theory that social presence or student interaction with peers is necessary to ensure an effective online learning environment. Instructional designers should thus create learning activities that foster peer collaboration and create learning communities using social media with which Chinese students are comfortable, as a platform for

communication and discussion.

Teaching presence. This term refers to the methods used by an instructor to promote a quality online environment and facilitate an effective CoI (Bangert, 2008).

Instructor presence. Most interview participants thought highly of the instructors in many of the Western MOOCs they took. Although the instructors only appeared on videos and had limited interaction with the students, they demonstrated excellent teaching and communication skills. The participants perceived the lecturers as knowledgeable, humorous, personable, and passionate about teaching. The students immediately felt a connection to them and were motivated to continue with the course.

Teaching assistants as course facilitators. Teaching assistants (TAs) usually doubled as course facilitators; however, the support and help that they provided to students varied between different courses and platforms. Most students said that it was not common to receive timely feedback from TAs. That said, when courses offered effective TAs, the students usually had a more positive perception of the learning experience and had a higher chance of completion.

Course design and organization. The participants shared their perceptions of the many course design elements during the interviews. Although design varies

between different courses on different platforms, students shared similar perceptions of what worked, what did not, what they liked, and what they disliked. Video quality was an important factor that informed students' learning experiences; most thought that courses on edX usually offered much higher quality videos than other platforms. The respondents also considered other course design elements to be critical in influencing students' learning experiences. For example, personalized email communication from the staff, course reminders, new course recommendations, and the availability of an auto-grader for assessments contributed to a positive learning experience; in contrast, a lack of guidance on course prerequisites or suggestions for subsequent courses created a poor learning experience.

These analyses confirmed a set of existing research findings that teaching presence affected students' perceptions of higher levels of learning (Kanuka, 2011; Shea, Li, & Pickett, 2006) and their success in online courses (Arbaugh, 2010; Garrison, Cleveland-Innes, & Fung, 2010; Kupczynski, Ice, Wiesenmayer, & McCluskey, 2010). Instructional designers should carefully design all the elements that can enhance teaching presence, such as improving the quality of instructional videos, offering effective support from TAs, and providing effective email communication.

Socio-cultural Factors

Based on the survey and interview results, Chinese students encountered language and technical barriers and threats to social identity during their experience of taking Western MOOCs.

Language barriers. The findings tell us that language barriers were a common issue for Chinese participants, including students from elite Chinese universities or those who were majoring in English. Instructional designers and course developers should make high-quality subtitles, in both English and Chinese, a high priority so as to help students overcome language barriers and make learning more effective.

Technical barriers. Participants identified internet connection issues as a major obstacle. In addition to slow internet speed, the internet firewall implemented by the Chinese government to block sensitive information (videos or websites) was also a significant barrier for Chinese students. Most participants adopted workarounds to these issues, such as using Virtual Private Network (VPN) technologies to bypass the firewall. However, when taking courses on Coursera, students usually had little difficulty because this platform has established a close partnership with local institutions and companies and can host videos on local servers. MOOC platforms should take this into

consideration and could explore opportunities to collaborate with local partners.

Belongingness and social identity threat. Social identity threat is the fear of being seen as less capable because of the group identified with. Many participants shared their concerns over not belonging or not being welcomed, or their worries of being seen as incompetent while participating in forum discussions in Western MOOCs. Some mentioned that they preferred having Chinese TAs and partnering with Chinese students during their studies. When a lot of Chinese students were in the same class, they tended to participate more in the discussion forum.

These findings are consistent with the conclusions from previous MOOC studies: Social identity threat appears to be a barrier to performance in an international learning context, even in an online environment with little social interaction (Kizilcec et al., 2017). Students are more likely to have a "best friend" (based on forum interactions) from a country in the same cultural cluster as their own (Liu et al., 2016). Thus, instructional designers must offer Chinese TAs, create opportunities for Chinese students to collaborate with compatriot peers, and implement other educational interventions that would reduce the social identity threat.

In summary, this research study offered a holistic view of Chinese

students' experience of taking Western MOOCs. In general, these courses exceeded the Chinese students' expectations and were perceived as high-quality and an effective method of learning. Most participants were satisfied with Western MOOCs, believing that these courses afforded them unprecedented opportunities to access high-quality Western courses freely. Although the MOOCs taken by the participants vary in terms of subjects, delivery platforms, length, and difficulty level, what worked well and did not work well for the participants was consistent across courses and platforms. These insights provide important implications for instructional design. For example, from the Chinese participants' perspective, the quality of courses was determined by the quality of instructional videos, well-defined objectives, prerequisites, an appropriate workload, and difficulty level. The lack of interaction with instructors and fellow learners caused learning difficulties for Chinese students. MOOC designers should carefully consider instructional strategies that enhance teaching and social presence, promote students' self-regulated learning behavior, and are more inclusive of their learning styles. Moreover, the particular challenges faced by Chinese students involved language, technical, and social barriers. MOOC designers should provide necessary support that helps students surmount these identified challenges. The participants also shared their perceptions of the

courses offered by their universities and the Chinese MOOCs they had taken. Unsatisfactory instructional quality was a key issue with the latter, while limited resources were a major stumbling block with the former. High-quality Western MOOCs can serve as an effective complement to the Chinese higher education system and have great potential to improve Chinese students' learning experience.

5.3 Implications of the Research

Through the conceptual framework of interaction equivalency and situational principles, this section will provide suggestions on how to improve the design of MOOCs for Chinese students, based on the research results from the document analysis, surveys, and interviews. Interaction equivalency and situational principles were discussed in detail in Chapter 2, but here is a brief review of these concepts:

- Interaction equivalency is a triad of interaction between the learner and the content, the learner and the instructor, and the learner and other learners (Anderson, 2003). The learner is at the center, with links to the three interactions. If one type of interaction decreases, interaction between the other two must increase.

- Situational principles reflect the situation or circumstances in which instruction is taking place when considering instructional design (Reigeluth, Carr-Chellman, Beabout, & Watson, 2009). This includes both the delivery method and the expected outcomes.

The implications of this study are twofold: the first is for Western MOOC designers and curriculum developers, and the second is for Chinese MOOC designers, curriculum developers, and educators in Chinese higher educational institutions.

Recommendations for Improving Western MOOCs

The recommendations for improving Western MOOCs include the following: enhance content quality; enhance peer interaction and provide social support; provide more teaching support; and collaborate with local universities and agencies to provide technical and credentialing support.

Enhance content quality. The content quality is the most critical factor for a successful MOOC learning experience, because learner-to-content interaction is the major factor in the linear and traditionally formatted xMOOC (MacIsaac, 2012). This study suggests the following design considerations for enhancing content quality: enrich the MOOC subject areas, systematically design a complete curriculum, clearly define and communicate course objectives and prerequisites,

design and produce high-quality instructional videos, design quizzes and assignments that fit the students' learning style, plan appropriate workload and difficulty levels, and provide language support.

First, MOOC providers should consider offering a wider variety of courses in recognition of Chinese students' increasing demand for Western MOOCs. The participants articulated that the available MOOCs were not sufficient to meet their needs. They wanted more courses that cover a range of liberal arts topics, based on the limited educational resources available in the Chinese educational system. In addition, designers must consider creating systematically designed educational programs that contain a series of courses rather than a stand-alone offering. The participants shared that the latter did not do enough to help them build their knowledge or skills. They wanted to see courses across a variety of difficulty levels, from entry level to advanced, especially for science and engineering subjects.

Second, the course designers should clearly define the target audience of the course, provide clear instruction on the course prerequisites, objectives, and requirements from the outset, and recommend subsequent courses for students upon completion. Instructional designers of MOOCs should also ensure that all the course elements and learning activities are tightly aligned with the course

objectives. A few participants in this study mentioned that they dropped out of courses because those courses did not meet their needs and expectations. The lack of prerequisites was one of the most critical factors in Chinese students' failure to complete Western MOOCs. Furthermore, the assignment types and difficulty level must be appropriate for the learning objectives and fit the online MOOC learning environment. Crucially, instructional designers must set the right expectations and provide sufficient guidance for students at the commencement of the course.

Third, instructional designers should produce high-quality instructional videos. The quality of video content and production has a significant impact on students' motivation and learning effectiveness. The instructors' attitudes, personality, and expertise were also major motivating factors for the Chinese students. The respondents appreciated instructors who were fun and knowledgeable and enjoyed instructional videos that were well produced.

Fourth, instructional designers should create learning activities that are better attuned to Chinese students' learning style. Most participants in this study preferred an evaluation-focused learning strategy. Regular knowledge checks or quizzes would be helpful for keeping students focused and create a more effective learning experience. Moreover, instructional designers of MOOCs

could devise more creative reward strategies, such as badges and a point system.

Fifth, instructional designers should provide guidance on self-regulated learning strategies. Course instructions should offer clear directions on the required learning activities, time needed for each activity, and difficulty level of the course as part of the syllabus or orientation materials, which can help students evaluate the course prior to enrolment. Designers should also furnish tips on how to manage time and how students can best use course resources at the beginning of the program.

Finally, instructional designers and course developers should provide high-quality subtitles in both English and Chinese, making this a priority in the course design and development process. Chinese students, including those from elite universities and English majors, considered the language barrier to be a major obstacle while taking MOOCs. The quality of the current MOOC subtitles must be improved.

Enhance peer interaction and provide social support. Most students interviewed and surveyed in this study felt they had very little interaction with fellow students and reported feeling isolated during the MOOC study. Most agreed that having a learning partner for their study would be highly beneficial and make the learning experience more enjoyable and effective. However,

Chinese students' efforts to find learning partners were hampered by social and language barriers.

Instructional designers should craft activities that promote learner-to learner interaction and create opportunities that foster peer collaboration. Course facilitators can divide the students into different study groups based on their interests or cultural background. In addition to peer review and assessment, synchronous virtual group activities, such as discussion and team projects, can be used to enhance learning with peers. The discussion board can also be tailored to encourage discussion within smaller groups.

Additionally, strength lies in facilitating and supporting learning communities for Chinese students outside of the MOOC learning platform. Most participants in this study indicated that they felt more comfortable using popular Chinese social media, such as WeChat or QQ, to engage with their peers. A helpful step would be to organize local meetups and provide learners with opportunities to find other Chinese learning partners.

Furthermore, a set of educational interventions, to reduce social identity threat and promote value affirmation and belongingness, should be considered. The respondents in this study hesitated to participate in discussion out of fear of being viewed as incompetent and a lack of confidence in language and other

skills. Some educational interventions have already been proven effective in reducing social identity threat: for example, a writing activity at the beginning of each MOOC that encourages learners to affirm cherished personal values, such as relationships with family; in another activity, students read testimonials from advanced learners, which helped them understand that doubts about belonging in the course are normal, short-lived, and not unique to them or members of their group (Kizilcec et al., 2017).

Provide more teaching support. xMOOCs provide little learner-to-instructor interaction because of the large number of enrolled students (MacIsaac, 2012). In the absence of instructors, teaching assistants were usually hired to serve as course facilitators who provided support for students. However, the level of support from these individuals varied from course to course. The participants in this study shared that, most of the time, they could not attain timely feedback and help from TAs in the MOOCs they had taken. For the few courses that offered excellent support from TAs, students had a positive perception of the learning experience and a higher chance of completion.

Instructional designers should carefully design all the elements that can enhance teaching presence and increase learner-instructor interaction, such as offering effective support from teaching assistants, communicating with students

regularly about progress, providing new course recommendations and so on, through emails or discussion boards. For Chinese students who encounter language and social barriers, they must also install Chinese TAs who can communicate with the students in their own language and have a better understanding of their culture.

Instructional designers should also consider all the possibilities offered by personalized learning and intelligent teaching support for students on a large scale, using advanced technologies. For example, a virtual learning companion with human traits was implemented in one of Georgia Institute of Technology's AI courses (Goel & Joyer, 2017); some designers created their own computer programs that analyzed learner information and generated knowledge to meet the learners' requirements and capabilities within a specific learning context or automatically generated assignments and assessments based on the current work submitted by students (Sadigh et al., 2012; Raghuveer & Tripathy, 2016).

Collaborate with local universities and agencies to provide technical and credentialing support. Designers of MOOC platforms should consider working with local Chinese institutions or agencies to solve the technical issues for Chinese students. For example, the learners encountered the lowest amount of technical problems with courses on Coursera because the creators of this

platform have established close partnerships with local Chinese companies, and all its videos are hosted on local servers.

In addition, MOOC providers must collaborate and partner with Chinese universities to offer credentials that are recognized by the Chinese educational system, so that Chinese students do not have to waste time retaking the same courses.

Recommendations for Improving Chinese MOOCs and Suggestions for Chinese Educators

The research findings also provided suggestions on how to improve Chinese MOOCs and ideas for Chinese educators. Both survey and interview results revealed the quality issues associated with Chinese MOOCs and the limited resources available in the higher educational system in mainland China. According to the survey results, the main reason for dropping out of Chinese MOOCs was poor course design. One of the major complaints about these courses was that many instructional videos were too boring and the instructors who appeared on them were sometimes just reading PowerPoint slides. The free access to both Western and Chinese MOOCs made students tend to draw comparison between these two types of courses and become aware of the differences of instructional design quality.

Critically, the instructional design practice for Chinese MOOC designers and instructors must be improved. Providers of these courses should invest in high-quality video production and train instructors to develop effective teaching skills for an online audience. Furthermore, all the key design considerations for enhancing content quality, as recommended for Western designers in the previous section, also apply to Chinese MOOC designers; for example, they should clearly define and communicate course objectives and prerequisites, design and produce high-quality instructional videos, plan quizzes and assignments that fit the students' learning style, and ensure an appropriate workload and difficulty levels.

Moreover, the results of this study suggested that flipped classroom practice would be able to help Chinese students better take advantage of the higher-quality Western MOOCs. As this research has demonstrated, Chinese students experienced certain obstacles, including language barriers, lack of interaction and belongingness, and threats to social identification, in a Western MOOC environment, despite being highly motivated to take part in learning during such a high-quality course. Additionally, in a traditional university classroom setting, students also experience a lack of interaction with instructors and other learners as a result of the high student-teacher ratio commonly seen in

the Chinese education system. Thus, integrating high-quality Western MOOCs with classroom flipping would maximize the advantages of both learning models, potentially improve learner-instructor interaction, and have a profound impact on the higher education system in China.

Although the flipped classroom was a concept explored intensively in the Chinese literature, the data collected in this research showed that the approach is still in the theoretical stage and has not yet been embraced by Chinese universities. One of the possible reasons may be that these institutions are concerned about a potential cultural invasion from Western MOOCs. Moreover, instructors working in higher education may view the integration of MOOCs into their teaching as a threat to their career. However, such an approach allows on-campus instructors to shift their time from creating and delivering lectures on content that sees little change, which they perceive as a lower-value activity, to the higher-value pursuit of working directly with students on the material. Such a model requires instructors to devote considerable time and effort to providing high-quality personalized instruction and in no way replaces face-to-face tutoring.

5.4 Limitations of the Study

In the first part of the study, the document analyses of both Western and Chinese literature focused on peer-reviewed journal articles. Some relevant studies, such as conference papers, might have been omitted in this research. Additionally, the 118 papers in the Western literature and 42 articles in the Chinese literature were from a limited timeframe; hence, the findings are limited to representing MOOC-based studies in this period. Undoubtedly, numerous new studies conducted since the time of this research could alter the trends of MOOCs studies that are revealed here.

In the second phase of the study, the researcher recruited participants for surveys and interviews through social media. Students who responded to such requests and who decided to participate in this study were wholly self-selecting and participated on a completely voluntary basis. As a result, the sample of respondents in this study may not be representative of the entire target population of undergraduate students in mainland China. Furthermore, the survey was interpreted in a descriptive and non-statistical way. A larger sample size for the survey would be required to gain additional reliability and validity.

The interviews were analyzed using qualitative coding and frequency counting techniques by searching for themes and patterns that could answer the

research questions. This qualitative research permitted a deeper understanding of the participants' experiences, motivation, and perceptions. However, it may not be possible to make general inferences or a broad application because of the limited sample size. This factor may also limit the generalizability to MOOC learners from other age groups or professions.

Chapter 6: Future Work

This study offers several directions for future research. First, the research subjects who participated in this study comprised only undergraduate students in China. Future research would benefit from the inclusion of participants across different age groups and career stages in China, particularly because different subgroups of MOOC learners could have different motivational factors, self-regulated learning behavior, and preferred learning and interaction styles. Understanding whether the different life and career stages of Chinese learners lead to different learning objectives, expectations, and challenges would be especially important.

Second, the study revealed that WeChat is very popular among Chinese students who are seeking to communicate with their peers or looking for help during MOOC learning. A report recently published in China found that 768 million users reported logging into WeChat every day and that 50% of users used WeChat for 90 minutes each day. Because WeChat can help individuals build a strong sense of community and connection through social interactions, communication, and cooperation, this social media tool has become a necessity of Chinese daily life for individuals and organizations alike. Accordingly, the author believes that future research into ways of effectively integrating WeChat

with MOOC learning for Chinese students could provide unique insights relevant to the field of online education.

Social media use generates tremendous amounts of data each day. To cite just one example, most of the participants in this study used WeChat to complete their questionnaire and also used it as the platform for their interview. Accordingly, future MOOC research should consider collecting data using social media and should expand the methodologies used for MOOC research.

Third, Chinese instructors' reasons for participating in MOOC learning remain unclear, as do their perceptions, experiences, and challenges. Although this study revealed a number of quality issues with Chinese MOOCs, very little is known about instructional design practices in China or about the current situation or future trends in this profession. All these are rich areas for future research: researchers could examine how Chinese instructors experience the design and development of these courses, investigating why they choose to teach MOOCs and how they perceive their relationship with MOOC learners, as well as whether that relationship differs from traditional student-learner relationships. Research in this area could also explore the experience of Chinese teaching assistants and their effect on improving learning performance.

Finally, additional cross-cultural comparative research might further

inform people in the field of how MOOC research paradigms, methods, and topics of interest differ among various regions of the world. Extending this research beyond China would create opportunities to identify the motivational factors, unique experiences, and challenges of learners from different countries and cultures, such as the African continent, Spanish-speaking countries, or Arabic-speaking countries.

The author looks forward to the exciting next decade of MOOC learning, with all the groundbreaking MOOC-related research topics and methods sure to come.

APPENDIX 1: SURVEY QUESTIONS

Dear MOOC learner,

We created this questionnaire to explore Chinese students' online learning experience with MOOCs. Your answers to the questions are completely anonymous and will only be used for this research. Please see links to the Information Letter for Participants and Participant Consent Form before you fill out the survey.

For anyone who has completed the survey is qualified for a $50 lottery drawing. Thanks for your time and support!

1. Are you currently an undergraduate student in one of the universities in mainland China?
    - Yes→ Continue to the next question
    - No → The end of the questionnaire. Thanks for your answer!
2. Have you taken at least one MOOC from western universities?
    - Yes→ Continue to the next question
    - No → The end of the questionnaire. Thanks for your answer!
3. What's your gender?
    - Male
    - Female
4. Which university are you enrolled in? _____
5. What's your major?
    - Science

- Engineering
- Liberal Arts

6. Which year are you in college?
    - Freshman
    - Sophomore
    - Junior
    - Senior
7. What subjects of MOOCs have you taken?
    - Math
    - Science
    - Liberal Arts
    - Engineering
    - Other_____
8. Where did you hear about MOOCs?
    - Recommended by friends
    - Recommended by teachers
    - Discovered by myself
    - Other_____(please specify)
9. What MOOCs platforms have you used?
    - Coursera
    - edX
    - Udacity

- Xuetangx
- Cn MOOC
- IMOOC
- Other _____(please specify)

10. How many Chinese MOOCs have you taken?
    - 0
    - 1
    - 2
    - 3
    - More than 3
11. How many MOOCs from western universities have you taken?
    - 0
    - 1
    - 2
    - More than 2
12. Have you ever dropped out of any Chinese MOOCs?
    - Yes. If yes, why?
        - Course is too difficult
        - Poor design of the course
        - Language barrier
        - Conflicts with other school/life priorities
        - Lack of perseverance

        - Network connection issues
        - Other_____ (please specify)
    - No

13. Have you ever dropped out of any western MOOCs?
    - Yes. If yes, why?
        - Course is too difficult
        - Poor design of the course
        - Language barrier
        - Conflicts with other school/life priorities
        - Lack of perseverance
        - Network connection issues
        - Other_____ (please specify)

14. What's the primary reason why you are taking MOOCs?
    - Free access to knowledge
    - Higher quality courses than what my university offers
    - A way to extend my knowledge
    - Required by school or teachers
    - Just want to experience MOOCs
    - Prepare for getting employed
    - Other_____ (Please specify)

15. What are your criteria for choosing which MOOC to take?
    - Courses from elite universities

- Courses taught by famous professors
- Courses related to my field of study
- Course delivered in Chinese or translated to Chinese
- Courses covering interesting topics
- Courses that offer certificates at the end of completion
- Other _____ (please specify)

16. What factors motivate you for participating in MOOCs study?

- Acquiring knowledge
- Acquiring certificate
- Acquiring job-related skills
- Satisfying personal interests and curiosity
- Taking personal challenges
- Increasing opportunities for getting employed
- Passing required exams (such as cet 4, college English exam)
- Something meaningful to do in my spare time
- Entertainment
- Making friends
- Other_____

17. How true are the following statements?

Your learning behavior	**Completely true**	**Mostly true**	**Not sure**	**Mostly not true**	**Not true at all**
You evaluate the difficulty of the course before enrolling in it					

You get basic information about the lectures and instructors before taking the course					
You make sure you plan and arrange sufficient time for each course you are taking					
You take notes while watching the videos and reading course-related materials					
You read all the recommended readings in the course					
You always finish the required assignments on time.					
You look for learning partners during the course					
You spend extra time studying in order to complete the assignments and pass the exam.					
You always actively engage in the discussion on the discussion board.					
You look for help within the course using social media, such as QQ, or discussion forum					

18. How much time have you spent on the following activities in a MOOC course?

Please order it from the longest time to the shortest time.

- Watching course videos
- Reading course materials
- Doing assignments

- Participating in discussion
- Doing labs
- Taking quiz
- Reading course orientation
- Reading Course wiki

19. What are the top three activities that you prefer spending most time in a MOOC course? _____

20. What are the barriers you have encountered during the MOOCs study?

- Have trouble watching the videos
- Have trouble uploading the assignments
- Lack of prerequisite knowledge and skill
- Language barrier
- Lack of time
- Lack of motivation
- Lack of interest
- Lack of perseverance
- Cannot find a learning partner
- Lack of feedback from the instructor
- Other_____ (Please specify)

21. How true are the following statements about the support you received during your MOOCs study?

The support you received	Completely true	Mostly true	Not sure	Mostly not true	Not true at all
The instructors or TAs will provide all the support that I need.					
On the course discussion forum, fellow students will help me with my questions.					
On the external social media groups (such as QQ, WeChat groups), I always get help from fellow students					
I get more help from external social media groups than the course discussion board.					
I get more help from my fellow students than TAs and instructors					

22. What are the greatest benefits you received by taking MOOCs courses?

- Obtained course certificates
- Helped me pass required exams, such as CET
- Obtained recognition from classmates
- Gained knowledge and skills
- Made new friends
- Improved self-directed learning
- Improved collaborative learning skills.
- Gained credits from my school

- Other _____ (please specify)

23. What are your perceptions of taking MOOCs?

Your perception	**Completely true**	**Mostly true**	**Not sure**	**Mostly not true**	**Not true at all**
MOOCs provide higher quality courses					
The tasks and assignments in MOOCs are easier to accomplish.					
It's easier to obtain the credits or certificates in MOOCs.					
It's easy to learn and use the MOOCs platform.					
The assessments in MOOCs are reasonable.					
MOOCs is a good option for learning online.					
MOOCs are very useful for me so I decide to continue to take MOOCs					
I'd highly recommend MOOCs to others					

24. What other feedback or suggestions do you have for western MOOCs?

25. Would you be interested in participating in follow-up interviews?

- Yes_____ (please provide your email address)
- No

APPENDIX 1.1 (CHINESE VERSION) SURVEY QUESTIONS

附录 1：调查问卷

亲爱的 MOOC 学习者，

我们创建了这个问卷，以探索中国学生在 MOOCs 上的在线学习体验。您对这些问题的回答只会用于这项研究。在填写调查表之前，请参阅给参与者的信和参与者同意书。任何完成调查的人都有资格获得 50 美元的彩票抽奖。感谢您的时间和支持！

1. 您目前是中国大陆某大学的本科生吗？
   - 是→ 继续下一个问题
   - 否→ 问卷结束。感谢您的回答！
2. 您是否学习过至少一门西方大学制作的 MOOC 课程？
   - 是→继续下一个问题
   - 否→问卷结束。感谢您的回答！
3. 您的性别？
   - 男
   - 女
4. 您入读了哪所大学？ _____
5. 您的专业是什么？_____
   - 科学
   - 工程
   - 文科
   - 其它
6. 您在大学几年级？
   - 一年级
   - 二年级
   - 三年级
   - 四年级
7. 您上过哪些科目的 MOOC 课程？

   •数学

   •科学

• 人文学科
•工程
•其它_____

8. 您从哪里听说过 MOOC？
   - 由朋友推荐
   - 由老师推荐
   - 自己发现
   - 其他_____（请注明）
9. 您使用过哪些 MOOC 平台？
   - Coursera
   - edX
   - Udacity
   - 学堂在线 Xuetangx
   - 好大学在线 Cn MOOC
   - 慕课网 IMOOC
   - 中国大学 MOOC (icourse163.org)
   - 其他_____（请注明）
10. 您学习过多少门中文的由中国大学或机构制作的 MOOC?
    - 0
    - 1
    - 2
    - 3
    - 超过 3 个
11. 您学习过多少门英文的由西方大学或机构制作的 MOOC?
    - 0
    - 1
    - 2
    - 3
    - 超过 3 个
12. 对于中国大学或机构制作的 MOOC,您有没有过没学完就半途退出的经历？
    - 是的。如果是，为什么？

      ♣课程太难了

      ♣课程设计不好

♣语言障碍

♣与其它学校或生活上的事情相冲突

♣缺乏毅力

♣网络连接问题

♣其他_____（请注明）

- 否

13. 对于西方大学或机构制作的 MOOC, 您有没有没学完就办途退出的经历？

- 是的。如果是，为什么？

♣课程太难了

♣课程设计不好

♣语言障碍

♣与其它学校或生活上的事情相冲突

♣缺乏毅力

♣网络连接问题

♣其他_____（请注明）

- 否

14. 您选择 MOOC 学习的主要原因是什么？

- 免费获得知识
- 比我大学提供的课程质量更高
- 一种扩展我的知识的方法
- 由学校或老师要求
- 只想体验 MOOCs
- 准备就业
- 其他_____（请注明）

15. 您选择 MOOC 的标准是什么？

- 来自精英大学的课程
- 由著名教授授课的课程
- 与我的学习领域有关的课程
- 课程以中文发表或翻译成中文

- 涵盖有趣课题的课程
- 在完成结束时提供证书的课程
- 其他_____（请注明）

16. 什么因素促使您学习 MOOC？

- 获得知识
- 获得证书
- 获得与工作有关的技能
- 满足个人兴趣和好奇心
- 个人挑战
- 增加就业机会
- 通过必修考试（如 cet 4，大学英语考试）
- 在业余时间有意义的事情
- 娱乐
- 交朋友
- 其他_____

17. 以下陈述是否正确?

您的学习行为	完全正确	大部分是正确的	不确定	大多数不是真实的	根本不是
您在注册之前先评估课程的难度是否适合自己					
在参加课程之前，您会先阅读有关讲座和讲师的基本信息					
您计划和安排好时间以确保有足够的时间去学习每门课程					

您会在观看视频和阅读课程相关资料的同时记录笔记					
您阅读所有推荐的阅读材料					
您总是按时完成所要求的作业					
您会在课程学习期间寻找学习伙伴					
您会花额外的时间学习，以完成作业，并通过考试。					
您总是积极参与讨论板上的讨论					
您会使用社交媒体（如QQ）或讨论区寻求帮助					

18. 您在 MOOC 课程学习过程中花费了多少时间进行以下活动？请从最长的时间到最短的时间排列:

- 观看课程视频
- 阅读课程材料
- 做作业
- 参与讨论
- 做实验室
- 参加测验
- 阅读课程介绍
- 阅读课程维基(wiki)

19. 您在 MOOC 课程学习过程中喜欢花费最多时间的前三项活动是什么？

_____

20. 您在 MOOC 学习过程中遇到的最大障碍是什么？

- 无法观看视频
- 无法上传作业
- 缺乏必要的预备知识和技能
- 语言障碍
- 时间不够
- 缺乏动力
- 缺乏兴趣
- 缺乏毅力
- 找不到学习伙伴
- 缺乏来自老师的反馈
- 其他_____（请注明）

21. 以下关于您在 MOOC 学习期间获得支持的陈述正确吗？

您收到的支持	完全正确	大部分是正确的	不确定	大多数情况下不是正确的	根本不是真的
导师或助教提供我需要的所有支持					
在课程讨论论坛上，同学们会帮我解答我的问题					
在外部社交媒体（如 QQ，微信群）上，我总是得到同学们的帮助					
我从外部社交媒体组获得更多的帮					

助，而不是课程讨论板					
我从同学那里得到了比助教和导师更多的帮助					

22. 通过参加 MOOC 课程，您获得的最大收益是多少？

- 获得课程证书
- 帮助我通过必修考试，如 CET
- 获得同学的认可
- 获得知识和技能
- 结交新朋友
- 改进的自主学习
- 提高协作学习技能
- 从我的学校获得学分
- 其他_____（请注明）

23. 您对 MOOC 有什么看法？

您的看法	完全正确	大部分是正确的	不确定	大部分是不正确	不是真的
MOOC 提供更高质量的课程					
MOOC 中的作业和任务更容易完成					
在 MOOCs 中获得学分或证书比较容易					
学习和使用 MOOC 平台很容易					
MOOC 中的评分是合理的					

MOOCs 是在线学习的好选择					
MOOC 对我非常有用，所以我决定继续学习 MOOC 课程					
我强烈推荐 MOOCs 给其他人					

24. 您对西方大学制作的 MOOC 课程有何其他意见或建议？

25. 您有兴趣参加本研究的后续访谈吗？

- 是_____（请提供您的电子邮件地址）
- 否

APPENDIX 2 INTERVIEW PROTOCOL

The purpose of this interview is to collect participants' personal reflections, perspectives, and accounts of their experience with taking MOOCs, especially with western MOOCs. This interview protocol is used as a guideline to elicit the participant's experience.

Interview Overview

This interview is expected to take typically 30-45 minutes. Each invited/selected research participant will spend this time to elicit his/her personal information, learning experience with MOOCs.

Part 1: Introduction by interviewer

Say to the interviewee:

Thank you very much for your time to participate in my research study. My name is Lei Ma, the researcher of this study. Before we start the interview, I would like to explain the objective of this study and this particular interview to you first. The purpose of the study is to investigate your perceptions and experience with MOOCs, especially western MOOCs. This also includes the investigation of your own judgment of how well you do with MOOCs; your beliefs and how they influence your MOOCs learning experience.

The interview will take about 30-45 minutes. If my interview questions are not clear to you at any point, please do not hesitate to ask for clarification. You can also request to withdraw from the interview session at any time if you feel uncomfortable. Do you, as of now, have any question before we start?

Part 2: Semi-structured interview questions

1. Can you tell me something about yourself: who you are, what you study and your education experience?
2. How did you hear about MOOCs? How did select which MOOCs to take?
3. Tell me about your experience of taking MOOCs from western countries.
4. Can you tell me what you liked and disliked about MOOCs in terms of course design and learning activities?
5. Have you ever had challenges with western MOOCs? What sorts of challenges? And how did you cope with challenges?
6. What support or feedback did you receive from the course instructor, TA, or fellow students?
7. Did you have learning partners while taking MOOCs? If so, what kind of help/support did you receive from your learning partners?
8. Which MOOCs have you successfully completed? What factors made you successfully complete the courses?
9. What factors made you drop out of some MOOCs?

10. If you have taken Chinese MOOCs as well, are there any differences between the Chinese MOOCs and western MOOCs? Also, any differences between MOOCs and the courses offered by your university?
11. What are the top 3 things you think western MOOCs can be improved upon?

APPENDIX 2.1 (CHINESE VERSION) INTERVIEW PROTOCOL

附录 2 访谈协议

这次采访的目的是收集参与者对 MOOCs 的思考，观点和体验，尤其是对西方的 MOOC 的看法。这个访谈协议被用来作为访谈指导大纲。

面谈概述

预计这次采访需要 30-45 分钟。每位受邀或选定的研究参与者将花费这段时间来谈论他/她的个人经历和 MOOC 学习经验。

第 1 部分：面试官介绍

对受访者说：

非常感谢您参与我的研究。我叫 Lei Ma，是这个研究的研究员。在我们开始采访之前，我想先解释一下这个研究和这次访谈的目的。这项研究的目的是调查您对 MOOCs，特别是西方 MOOCs 的看法和经验。调查还包括您自己对 MOOC 学习成效的判断;您的信念价值观以及它们如何影响您的 MOOC 学习体验。

面试大概需要 30-45 分钟。如果我的面试问题在任何时候都不清楚，请随时提出，不要犹豫。如果您感到不舒服，您也可以随时要求退出面试。到目前为止，您是否有任何疑问？您能否阅读同意书，如果您有任何问题，请告诉我。

第 2 部分：样本面试问题

1.您可以告诉我一些关于您自己的事情：您是谁，您学习什么专业和您的教育经历？

2. 您是怎么听说 MOOC 的？您是如何选择 MOOC 的？

3. 请告诉我您学习西方大学制作的 MOOC 的经历。

4. 您能告诉我您对 MOOC 在课程设计和学习活动方面喜欢和不喜欢的地方吗？

5.您有没有在学习西方大学 MOOC 时遇到过挑战？是什么样的挑战？你是如何应对的？

6.您从课程导师，助教或同学们那里得到什么支持或反馈？

7.您在学习 MOOC 时是否有学习伙伴？如果是这样，您从学习伙伴那里得到了什

么样的帮助/支持？

8.您成功完成了哪些 MOOC？什么因素使您成功完成课程？

9.什么因素使您半途退出一些 MOOCs？

10.如果您也学习过中国大学或机构制作的 MOOCs，中国大学的 MOOCs 和西方大学的 MOOCs 有什么区别吗？另外，MOOC 和你们大学提供的课程之间有什么不同？

11.您认为西方 MOOCs 可以改进的最重要的三个方面是什么？

APPENDIX 3: INFORMATION LETTER FOR PARTICIPANTS

BOSTON UNIVERSITY

SCHOOL OF EDUCATION

Two Silber Way, Boston, MA 02215

www.bu.edu/sed

Dissertation supervisor:

Dr. Bruce Fraser bfraser@bu.edu

Dec 15, 2017

CROSS-CULTURAL MOOCs: DESIGNING MOOCs FOR CHINESE STUDENTS

Information for Participants

Dear participant,

My name is Lei Ma. I am a doctoral candidate in the School of Education at Boston University. I am conducting a research study as part of the requirements for my Ed.D. (Doctor of Education).

Introduction to this research project

I am studying Chinese students' experience of taking MOOCs from western universities.

Invitation

I would like to invite you to take part in this research project. Before you decide whether to participate, it is important that you understand why the project is being conducted and what your participation would involve. Please take time to read the following information and the consent form carefully. Please contact me if there are any aspects of the project that are unclear, or if you would like more information.

Why have you been chosen?

For this study, I am seeking participants who are currently undergraduate students in a university of mainland China and who have taken at least one MOOC from western universities.

What will happen during the study?

There are two parts in the study. The first part is filling out an online questionnaire. The second part is to have an online interview with me. You can choose the video-conferencing platform you prefer for the interview, such as WeChat, QQ, or Skype. You can decide whether you want to participate in one part or both parts of the study or not to participate at all. In the interview, you will be asked questions about your experience and perceptions of taking a MOOC course. The meeting will take place online at a mutually agreed upon time and should last about 30-45 minutes. The interview will be audio recorded so that I can accurately reflect on what is discussed. The tapes will only be reviewed, transcribed, and analyzed by me. They will then be destroyed. ￥130 Chinese Yuan (about 20 US dollars) will be offered to participants who complete the in-depth interviews and an additional ￥50 Chinese Yuan (about 8 US dollars) for answering follow-up questions.

Do you have to participate? What are the risks and benefits of participating?

Taking part in the study is your decision. Participation is confidential. You may also quit being in the study at any time or decide not to answer any question you are not comfortable answering. Although you probably won't benefit directly from participating in this study, we hope that others in the community/society in general will benefit by more effective planning of future MOOC programs. The risks of participating in the study involve breach of confidentiality. We will make every effort to keep your records confidential. The process of preventing breach of confidentiality is explained in more details below.

What will happen to the results of this research?

The results of this research will be analyzed for Boston University doctoral dissertation. None of the transcripts will be shared with anyone else besides yourself and dissertation committee members. The results of the analyses may be published in academic publications or presented at academic conferences in the future. You will not be identifiable in any of the publications or presentations. No one but me and my dissertation committee members will have access to your personal demographic information. All paper materials will be kept in a locked filing cabinet to which only I have the key, and all electronic data will be password protected. All paper materials, and any electronic data where you are identifiable, will be destroyed once the materials have been analyzed. Any potentially identifying words will be removed from electronic data, which will be kept indefinitely in order to be used for later research by me or other researchers, unless you indicate on the consent form that you wish the anonymized data to be destroyed. We will make every effort to keep your records confidential. However, there are times when federal or state law requires the disclosure of your records.

Who is organizing the research?

This research is organized as a doctoral research study under the supervision of School of Education Boston University, USA.

Contact for Further Information or Follow-up

Should you have any further questions about this research, please do not hesitate to contact me via my primary Boston University email address at: leima@bu.edu. Should you have any comments or concerns about this study at any time, and you are not satisfied with the answers I have given you, you can contact my advisors, Dr. Bruce Fraser, bfraser@bu.edu, Dr. Domenic Screnci, dscrenci@bu.edu, or Prof. Jennifer Green at IRB office, jggreen@bu.edu.

Thank you for your consideration. Please let me know if you would like to participate.

With kind regards,
Lei Ma
leima@bu.edu

APPENDIX 3.1 (CHINESE VERSION) INFORMATION LETTER FOR PARTICIPANTS

附录 3.1：参与者的资料信

波士顿大学教育学院
Two Silber Way，Boston，MA 02215
www.bu.edu/sed
研究员：Lei Ma
论文导师：

- Dr. Bruce Fraser
  电子邮件：bfraser@bu.edu
- Dr. Domenic Screnci
  电子邮件：dscrenci@bu.edu

2017 年 12 月 15 日

跨文化 MOOCs：为中国学生设计 MOOCs
给参与者的一封信

亲爱的参与者，

我叫 Lei Ma。我是波士顿大学教育学院的博士候选人。我正在进行一项研究，作为我的 Ed.D（教育学博士）的一部分要求。这个研究是关于中国学生在学习西方 MOOC 的体验。我想邀请您参加这个研究项目。在决定是否参与之前，请花时间仔细阅读以下信息和同意书。如果项目的任何方面不清楚，或者想了解更多信息，请联系我。

您为什么被选中？

对于这项研究，我正在寻找目前在中国大陆本科生的参与者，他们至少学习过一门西方大学 MOOC。

研究期间会发生什么？

研究有两部分。第一部分是填写在线调查问卷。第二部分是接受我的网上采访。您可以选择您想要的平台来接受采访，例如 WeChat, QQ or Skype. 您可以决定是否参加一部分或两部分的研究，或者根本不参加。在面试中，您会被问到您的经历和学习 MOOC 课程的体验。网络会议将在双方同意的时间在线进行，时间约为 30-45 分钟。会议将录音，以便我可以准确地反思讨论的内容。录音只能由我审阅，转录和分析。然后他们将被销毁。会议结束后，每位参加者将收到 130 元人民币的礼品卡作为赠品。对于后续问题的回答，您将 50 元人民币的礼品作为赠品。

您必须参加吗？参与的风险和好处是什么？

是否参与研究完全是您的决定。参与是保密的。您也可以随时退出研究，或决定不回答您不想回答的问题。虽然您可能不会直接从这项研究中受益，但我们希望社区/社会上的其他人能够通过更有效地规划未来的 MOOC 学习来获益。参与研究的风险涉及违反保密规定。我们将尽一切努力为您的记录保密。以下更详细地解释防止违反保密的过程。

这项研究的结果会发生什么？

本研究的结果将作为波士顿大学博士论文的一部分。除了我自己和论文委员会成员之外，任何数据都不会与其他人分享。分析结果可以在学术刊物上发表，或者在将来的学术会议上发表。您的个人信息在任何出版物或演示文稿中都不会被识别到。除我和我的论文委员会成员外，没有人可以访问您的个人信息。所有的纸质材料将被保存在一个锁定的档案柜中，只有我有钥匙，所有的电子数据将被密码保护。所有纸质材料以及您可识别的任何电子数据将在材料分析后被销毁。任何潜在的识别单词将从电子数据中删除，其他电子数据将被无限期保存，以供我或其他研究人员进行后续研究，除非您在同意书上注明您希望匿名数据被销毁。我们将尽一切努力为您的记录保密。但是，有时联邦或州法律要求披露您的记录。

谁在组织该研究？

本研究是在美国波士顿大学教育学院的监督下进行的博士研究课题。

联系进一步的信息或后续

如果您对本研究有任何疑问，请随时通过我的波士顿大学主要电子邮件地址 leima@bu.edu 与我联系。如果您在任何时候对本研究有任何意见或疑虑，并且您对我给予的答复不满意，可以联系我的导师 Bruce Fraser 博士，bfraser@bu.edu 或 Domenic

Screnci 博士，dscrenci@bu.edu 或者 IRB 办公室的 Jennifer Green 教授 jggreen@bu.edu.

如果您想参加该研究请和我联系。感谢您的参与。

Lei Ma
leima@bu.edu
484-515-2726

APPENDIX 4: PARTICIPANT CONSENT FORM

BOSTON UNIVERSITY

SCHOOL OF EDUCATION

Two Silber Way, Boston, MA 02215

www.bu.edu/sed

Researcher: Lei Ma

Email: leima@bu.edu

Dissertation supervisors:

• Dr. Bruce Fraser

Email: bfraser@bu.edu

• Dr. Domenic Screnci

Email: dscrenci@bu.edu

Dec 15 2017

CROSS-CULTURAL MOOCs:

DESIGNING MOOCs FOR CHINESE STUDENTS

Participant Consent Form

This research study aims to examine Chinese students' experience of taking western MOOCs and explore how to design MOOCs for Chinese students. This is a study undertaken by Lei Ma, a doctoral student in Curriculum and Teaching with a specialization in Educational Media and Technology, School of Education Boston University.

The risk of the study involves breach of confidentiality. The following

steps will be taken in order to minimize the risks of breach of confidentiality: No one but me and my dissertation committee members will have access to the participants' personal demographic information. All paper materials will be kept in a locked filing cabinet to which only I have the key, and all electronic data will be password-protected. All paper materials, and any electronic data where the participants are identifiable, will be destroyed once the materials have been analysed.

There are two stages for participating in the study: filling out a questionnaire and participating in an online interview. The participants can choose the video-conferencing platform they prefer for the interview, such as WeChat, QQ, or Skype. It will take about 15 minutes to fill out a questionnaire and 30-45 minutes to participate in the interview. Follow-up questions may be sent after the interview. It will take about 10 minutes to answer the follow-up questions. ￥130 Chinese Yuan (about 20 US dollars) will be offered to participants who complete the in-depth interviews and an additional ￥50 Chinese Yuan (about 8 US dollars) for answering follow-up questions.

1. I have understood the information about and procedures in this study in the information letter. I have considered all the risks involved. I have had an

opportunity to ask questions, and any questions have been answered satisfactorily.

2. I have decided to participate in the following stages in this study: (Please circle one or both options below)

- Filling out the questionnaire
- Participating in interview(s). I agree to have the interview audio-recorded and stored.

3. I have understood that participation in this study is voluntary and that I can withdraw from the study at any time, without consequence and without having to give a reason. If I decide to withdraw, I will let Lei Ma know as soon as possible.

4. I have understood that the researcher in this study and the dissertation committee members will have access to my information or data provided, and I have understood how the data will be stored and what will happen to the data at the end of the project.

5. I have understood that confidentiality of information is subject to normal legal requirements.

6. I am aware of who to contact should I have questions or concerns during or following my participation in this study.

7. I have understood that this project has been reviewed by and received ethical clearance through Institutional Review Board (IRB) of Boston University.

APPENDIX 4.1 (CHINESE VERSION) PARTICIPANT CONSENT FORM

附录 4.1：参与者同意书

波士顿大学 教育学院
Two Silber Way, Boston, MA 02215
www.bu.edu/sed
研究员：Lei Ma
电子邮件：leima@bu.edu
论文主管：

- Dr. Bruce Fraser
  电子邮件：bfraser@bu.edu
- Dr. Domenic Screnci
  电子邮件：dscrenci@bu.edu

2017 年 12 月 15 日

跨文化 MOOCs：为中国学生设计 MOOCs
参与者同意书

本研究旨在探讨中国学生学习西方 MOOCs 的体验，探索如何为中国学生设计 MOOCs。这是由波士顿大学教育学院教育媒体与技术专业的博士生 Lei Ma 所做的一项研究。

研究的风险涉及违反保密规定。为了尽量减少违反保密的风险，将采取以下步骤：除 Lei Ma 和 Lei Ma 的论文委员会成员外，没有任何人可以访问参与者的个人信息。所有的纸质材料将被保存在一个锁定的档案柜中，只有我有钥匙，所有的电子数据将被密码保护。所有纸质材料以及参与者可识别的任何电子数据将在材料分析后被销毁。

参与研究有两个阶段：填写问卷和参加在线面谈。参与者可自行选择网络视频平台接受面谈，例如微信，QQ，或者 Skype。大约需要 15 分钟的时间填写问卷，30-45 分钟参加面试。面试后可能会发送跟进问题。这将需要大约 10 分钟的时间来回答后续问题。参与者将获得 130 元人民币作为参加面谈的报偿，和 50 元人民币作为参加回答后续问题的报

偿。

1. 我已经了解了这封信中的信息和程序。我考虑过所有的风险。我有机会提问，任何问题都得到了令人满意的回答。
2. 我决定参加本研究的以下一个或两个阶段：
   - 填写问卷
   - 参加面试。我同意采访音频记录和存储。
3. 我明白参加这项研究是自愿的，我可以在任何时候退出研究，没有任何后果，也没有理由。如果我决定退出，我会尽快让 Lei Ma 知道。
4. 我了解到本研究中的研究人员和论文委员会成员将可以访问我提供的信息或数据，并且我已经理解了数据如何被存储以及项目结束时的数据会发生什么。
5. 我了解到，信息的保密是受正常法律规定的限制的。
6. 如果我在参加本研究期间或之后有任何疑问或疑虑，我知道应该联系谁。
7. 我了解到，这个项目已通过波士顿大学的机构审查委员会（IRB）进行审查并获得了道德许可。

APPENDIX 5: SURVEY RESULTS

1.您目前是中国大陆某大学的本科生吗? [单选题]
Are you currently an undergraduate student in one of the universities in mainland China?

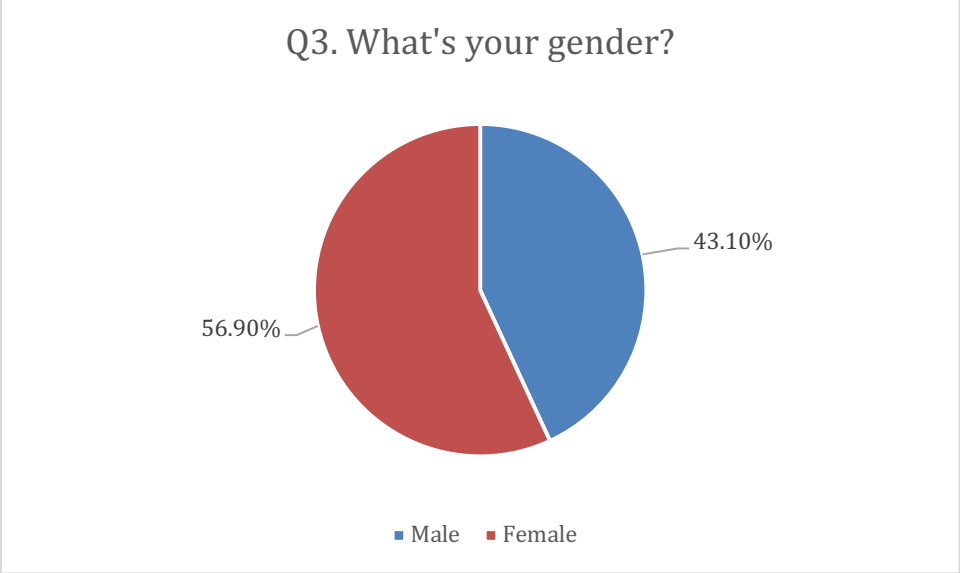
选项 Options	小计 Total	比例 Percentage
是 Yes	58	100%
否 No	0	0%
本题有效填写人次	58	

2.您是否学习过至少一门西方大学制作的 MOOC 课程? [单选题]
Have you taken at least one MOOC made by western universities or organizations?

选项 Options	小计 Total	比例 Percentage
是 Yes	58	100%
否 No	0	0%
本题有效填写人次 Number of Valid answers	58	

3.您的性别? [单选题]
What's your gender?

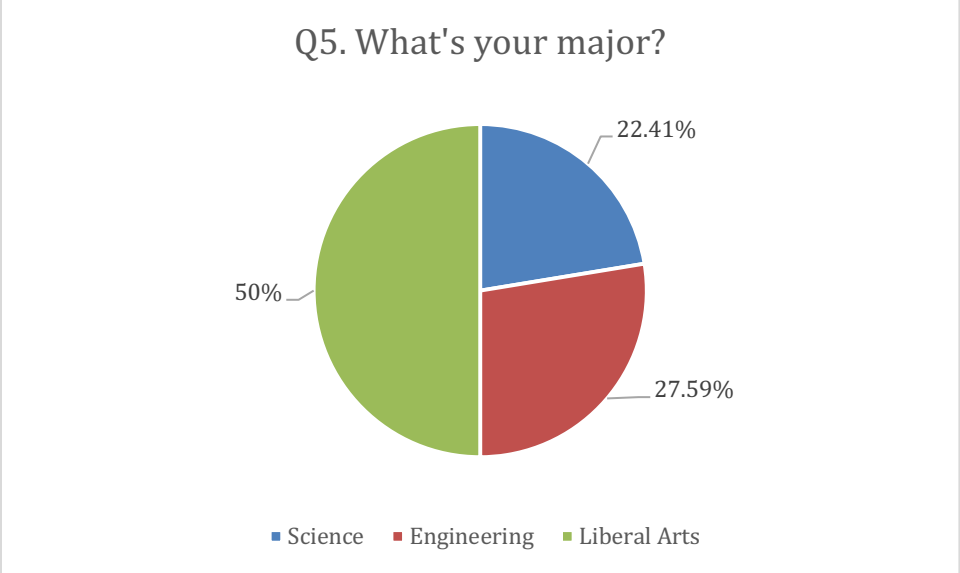
选项 Options	小计 Total	比例 Percentage
男 Male	25	43.10%
女 Female	33	56.90%
本题有效填写人次 Number of Valid Answers	58	



5.您的**专业**是什么? [单选题]

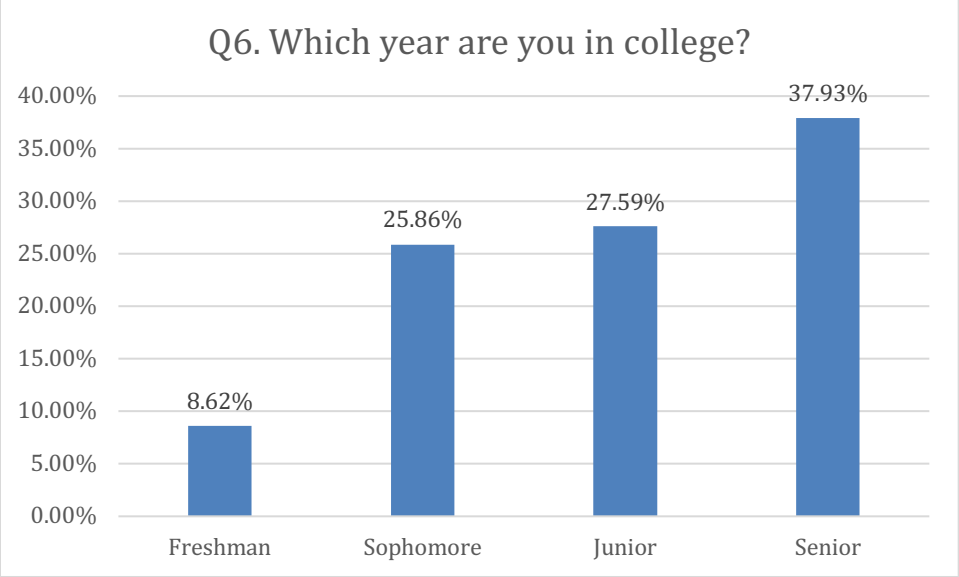
What's your major?

选项 Options	小计 Total	比例 Percentage
科学 Science	13	22.41%
工程 Engineering	16	27.59%
文科 Liberal Arts	29	50%
本题有效填写人次 Number of valid answers	58	



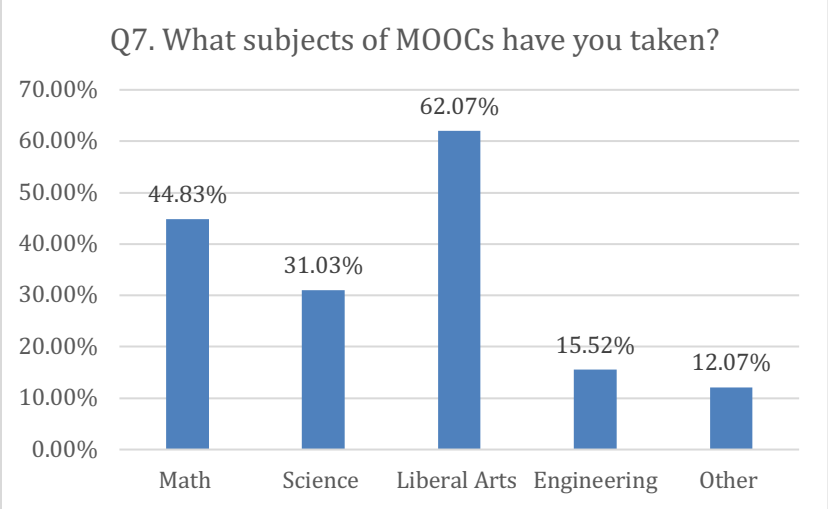
6.您在大学几年级? [单选题]
Which year are you in college?

选项 Options	小计 Total	比例 Percentage
一年级 Freshman	5	8.62%
二年级 Sophomore	15	25.86%
三年级 Junior	16	27. 59%
四年级 Senior	22	37.93%
本题有效填写人次 Number of valid answers	58	



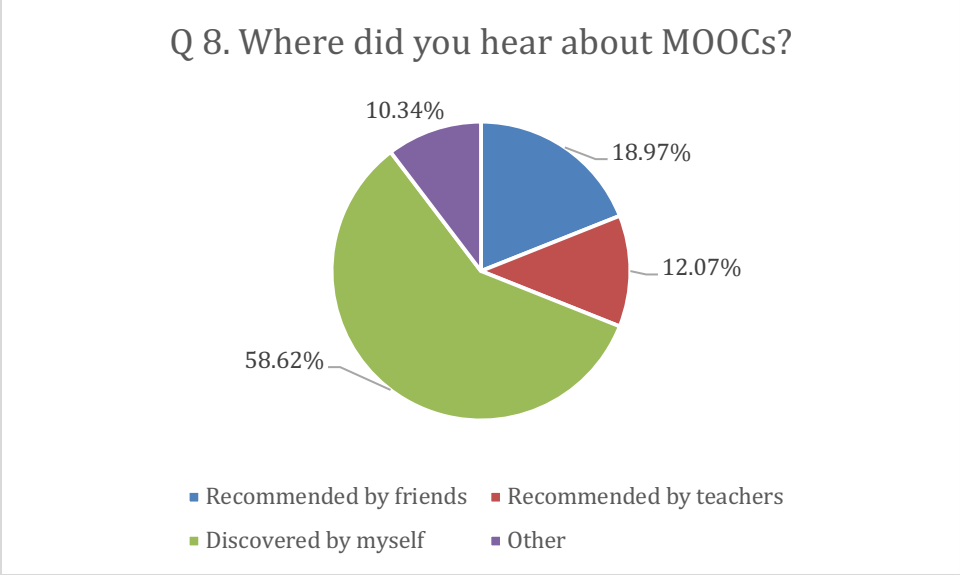
7.您上过哪些科目的 MOOC 课程? [多选题]
What subjects of MOOCs have you taken?

选项 Options	小计 Total	比例 Percentage
数学 Math	26	44.83%
科学 Science	18	31.03%
人文学科 Liberal Arts	36	62.07%
工程 Engineering	9	15.52%
其它 Other	7	12.07%
本题有效填写人次 Number of participants who provide valid answers	58	



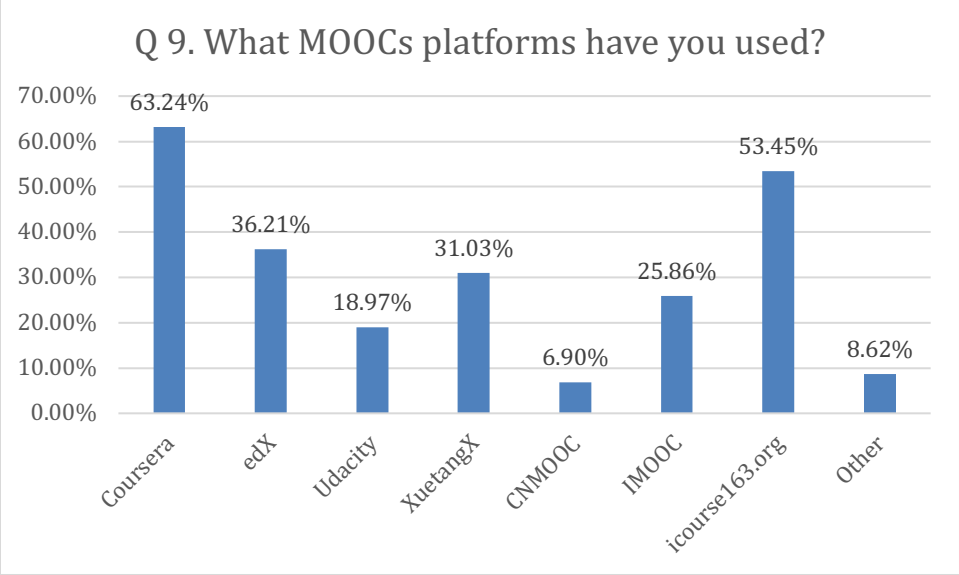
8.您从哪里听说过 MOOC? [单选题]
Where did you hear about MOOCs?

选项 Options	小计 Total	比例 Percentage
由朋友推荐 Recommended by friends	11	18.97%
由老师推荐 Recommended by teachers	7	12.07%
自己发现 Discovered by myself	34	58.62%
其他 Other	6	10.34%
本题有效填写人次 Number of participants who provide valid answers	58	



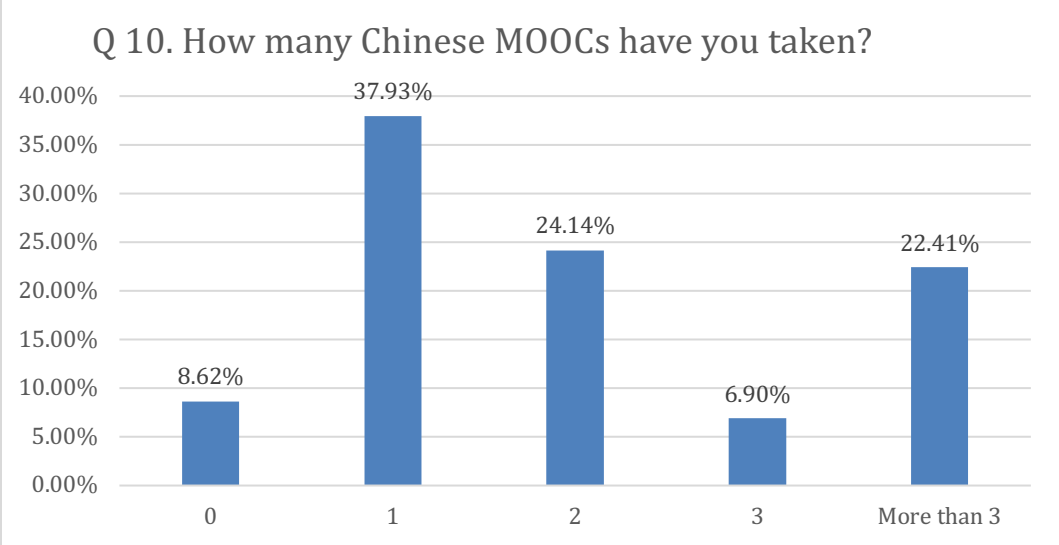
9.您使用过哪些 MOOC 平台? [多选题]
What MOOCs platforms have you used?

选项 Options	小计 Total	比例 Percentage
Coursera	43	63.24%
edX	21	36.21%
Udacity	11	18.97%
学堂在线 XuetangX	18	31.03%
好大学在线 CNMOOC	4	6.90%
慕课网 IMOOC	15	25.86%
中国大学 MOOC(icourse163.org)	31	53.45%
其他 Other	5	8.62%
本题有效填写人次 Number of participants who provide valid answers	58	



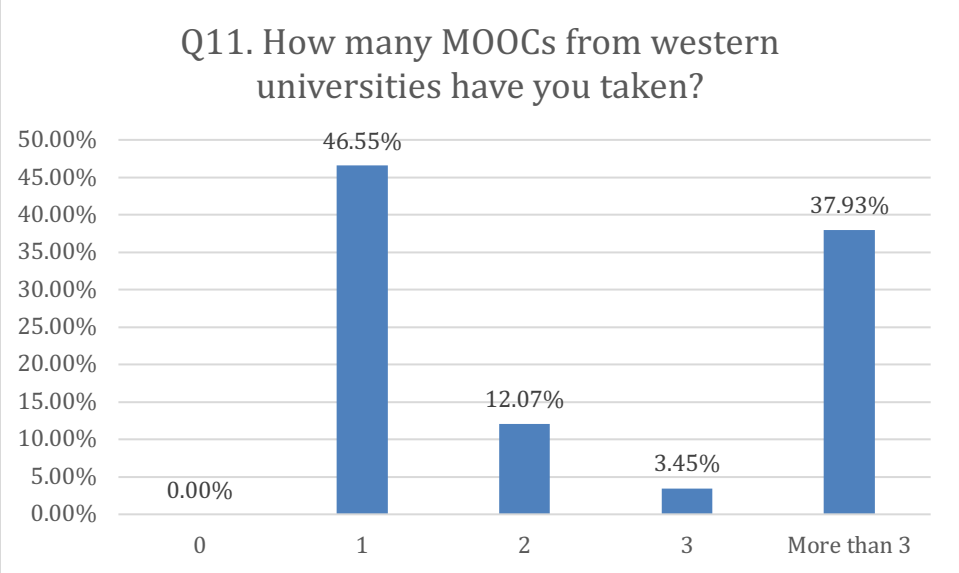
10.您学习过多少门中文的由中国大学或机构制作的 MOOC? [单选题]
How many Chinese MOOCs have you taken?

选项 Options	小计 Total	比例 Percentage
0	5	8.62%
1	22	37.93%
2	14	24.14%
3	4	6.90%
超过 3 个	13	22.41%
本题有效填写人次	58	



11.您学习过多少门英文的由西方大学或机构制作的 MOOC? [单选题]
How many MOOCs from western universities have you taken?

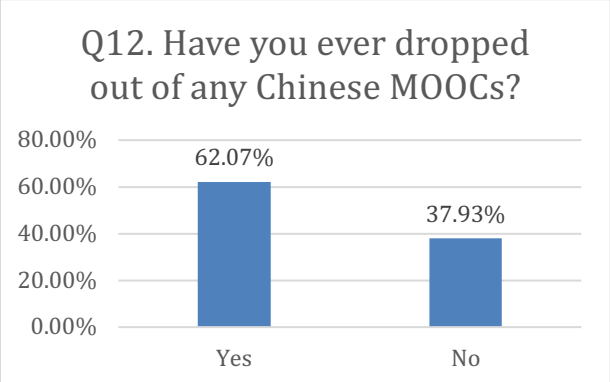
选项 Options	小计 Total	比例 Percentage
0	0	0%
1	27	46.55%
2	7	12.07%
3	2	3.45%
超过 3 个 More than 3	22	37.93%
本题有效填写人次 Number of valid answers	58	



12.对于中国大学或机构制作的 MOOC,您有没有过没学完就半途退出的经历? [单选题]

Have you ever dropped out of any Chinese MOOCs?

选项 Options	小计 Total	比例 Percentage
是的 Yes	36	62.07%
否 No	22	37.93%
本题有效填写人次	58	



如果是,为什么? [单选题]

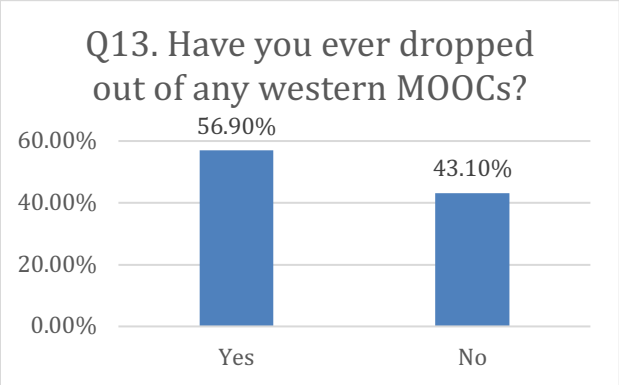
If yes, why?

选项 Options	小计 Total	比例 Percentage
课程太难了 Course is too difficult	2	5.56%
课程设计不好 Poor design of the course	16	44.44%
语言障碍 Language barrier	0	0%
与其它学校或生活上的事情相冲突 Conflicts with other school/life priorities	9	25%
缺乏毅力 Lack of perseverance	5	13.89%
网络连接问题 Network connection issues	0	0%
其他 Other	4	11.11%
本题有效填写人次 Number of valid answers	36	

13.对于西方大学或机构制作的 MOOC,您有没有过没学完就半途退出的经历? [单选题]
Have you ever dropped out of any western MOOCs?

选项 Options	小计 Total	比例 Percentage
是的 Yes	33	56.90%
否 No	25	43.10%

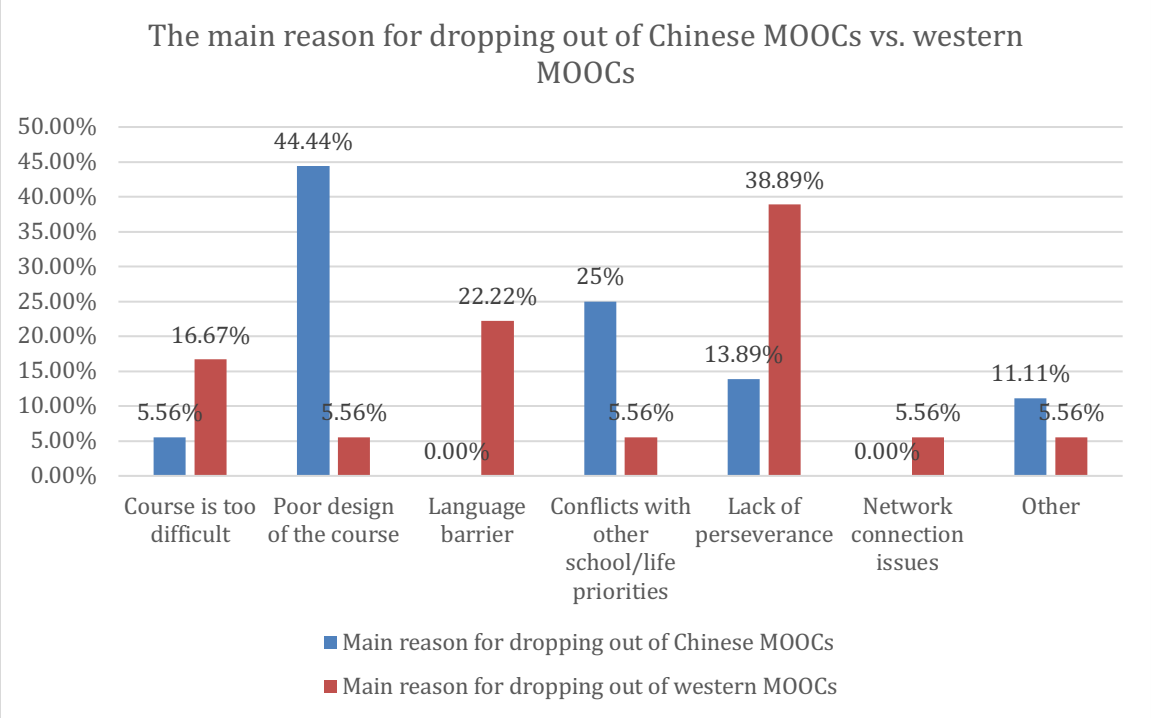
本题有效填写人次 Valid number of answers	58	



如果是,为什么? [单选题]
If yes, why?

选项 Options	小计 Total	比例
课程太难了 Course is too difficult	5	16.67%
课程设计不好 Poor design of the course	2	5.56%
语言障碍 Language barrier	7	22.22%
与其它学校或生活上的事情相冲突 Conflicts with other school/life priorities	2	5.56%
缺乏毅力 Lack of perseverance	13	38.89%
网络连接问题 Network connection issues	2	5.56%
其他 Other	2	5.56%

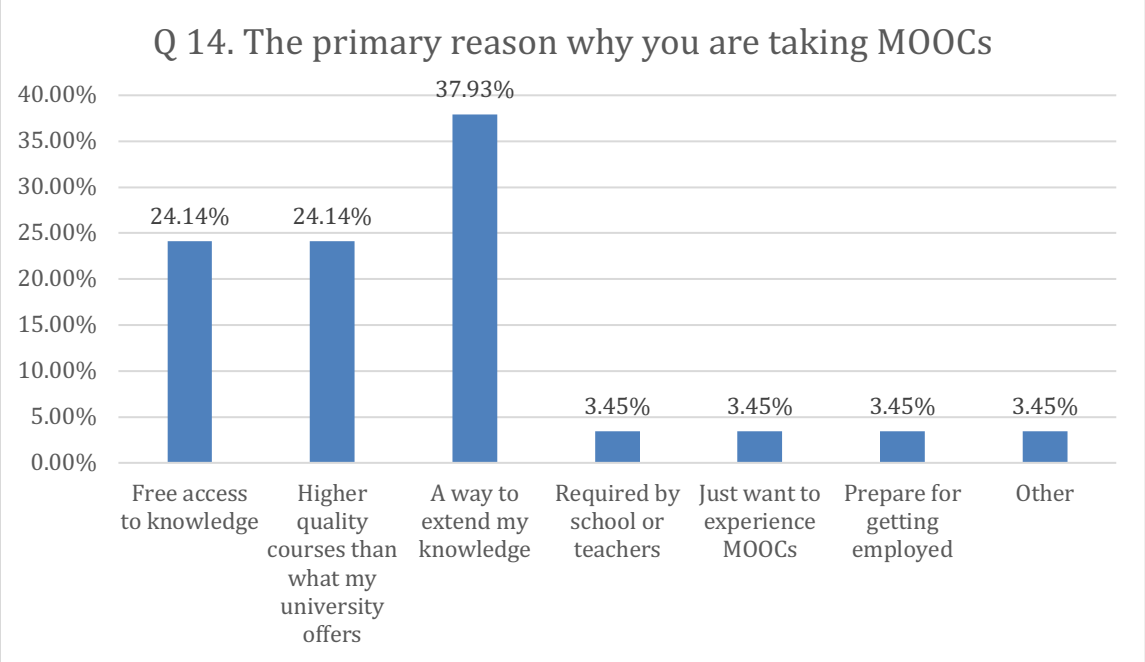
本题有效填写人次 Number of valid answers	33	



14.您选择 MOOC 学习的主要原因是什么? [单选题]
What's the primary reason why you are taking MOOCs?

选项 Options	小计 Total	比例 Percentage
免费获得知识 Free access to knowledge	14	24.14%
比我大学提供的课程质量更高 Higher quality courses than what my university offers	14	24.14%
一种扩展我的知识的方法 A way to extend my knowledge	22	37.93%

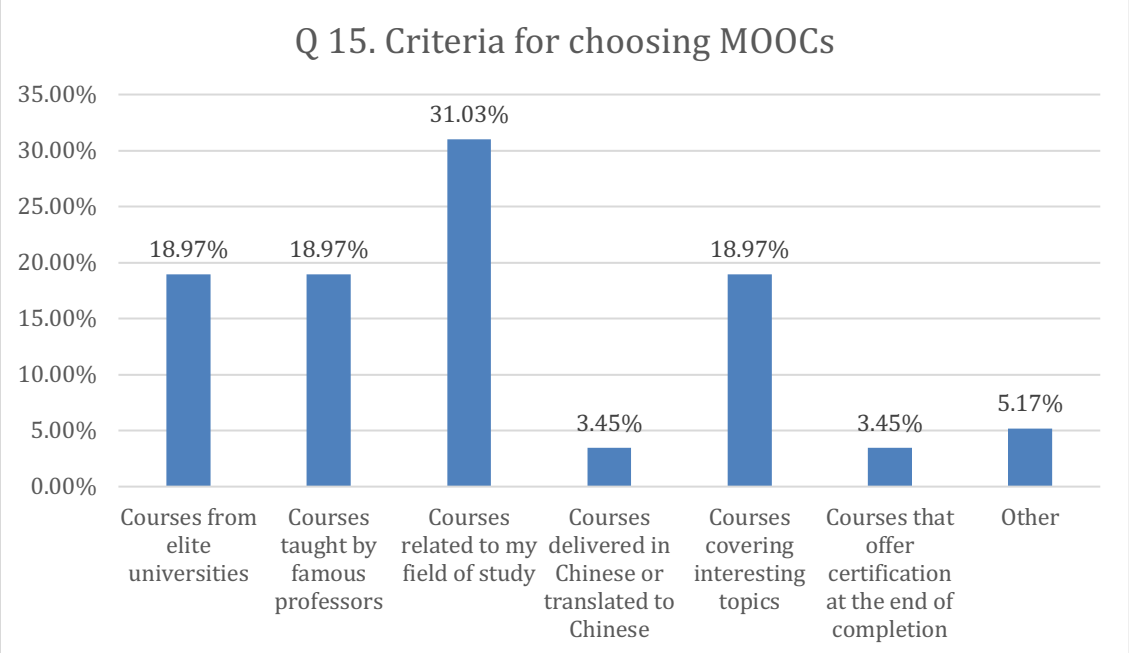
由学校或老师要求 Required by school or teachers	2	3.45%
只想体验 MOOCs Just want to experience MOOCs	2	3.45%
准备就业 Prepare for getting employed	2	3.45%
其他 Other	2	3.45%
本题有效填写人次 Number of valid answers	58	



15.您选择 MOOC 的标准是什么? [单选题]
What are your criteria for choosing which MOOCs to take?

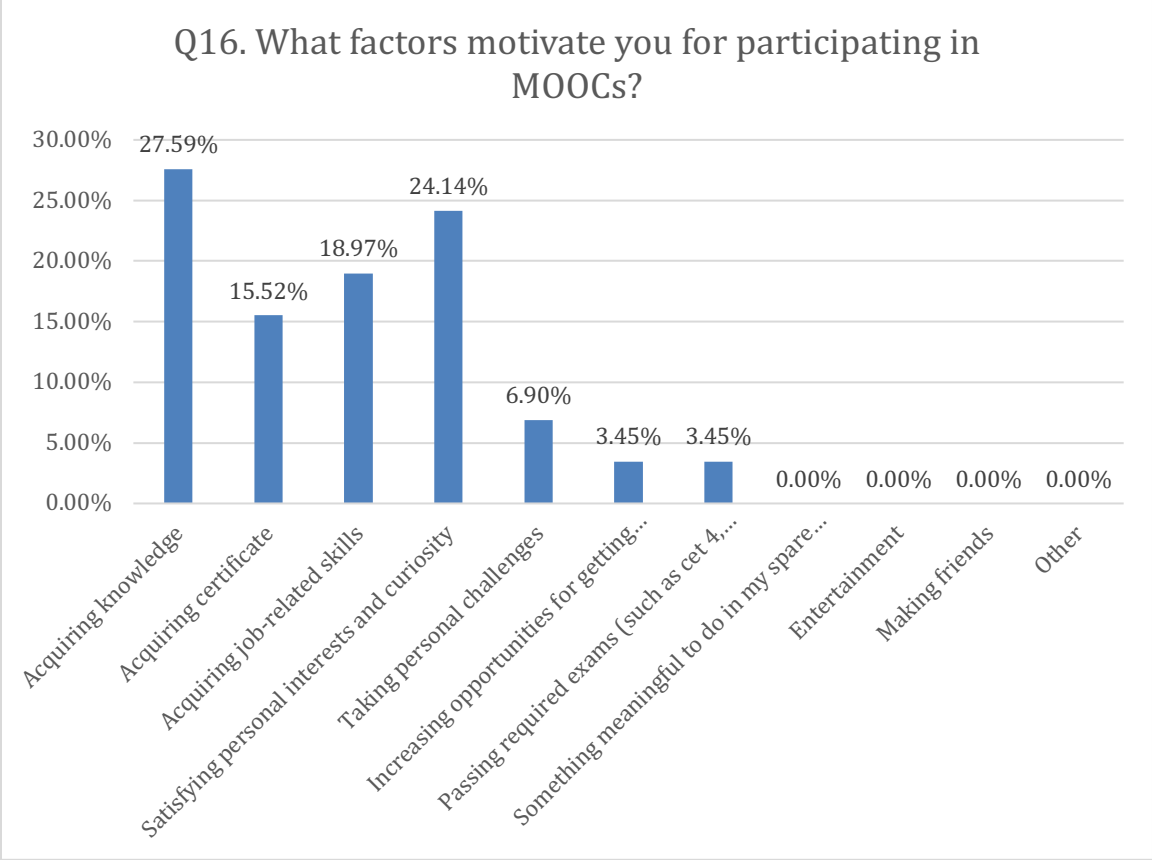
选项 Options	小计 Total	比例 Percentage
来自精英大学的课程 Courses from elite universities	11	18.97%

由著名教授授课的课程 Courses taught by famous professors	11	18.97%
与我的学习领域有关的课程 Courses related to my field of study	18	31.03%
课程以中文发表或翻译成中文 Courses delivered in Chinese or translated to Chinese	2	3.45%
涵盖有趣课题的课程 Courses covering interesting topics	11	18.97%
在完成结束时提供证书的课程 Courses that offer certification at the end of completion	2	3.45%
其他 Other	3	5.17%
本题有效填写人次 Number of valid answers	58	



16.什么因素促使您学习 MOOC? [单选题]
What factors motivate you for participating in MOOCs study?

选项 Options	小计 Total	比例 Percentage
获得知识 Acquiring knowledge	16	27.59%
获得证书 Acquiring certificate	9	15.52%
获得与工作有关的技能 Acquiring job-related skills	11	18.97%
满足个人兴趣和好奇心 Satisfying personal interests and curiosity	14	24.14%
个人挑战 Taking personal challenges	4	6.90%
增加就业机会 Increasing opportunities for getting employed	2	3.45%
通过必修考试(如 cet4,大学英语考试) Passing required exams (such as cet 4, college English exam)	2	3.45%
在业余时间有意义的事情 Something meaningful to do in my spare time	0	0%
娱乐 Entertainment	0	0%
交朋友 Making friends	0	0%
其他 Other	0	0%
本题有效填写人次 Number of valid answers	58	

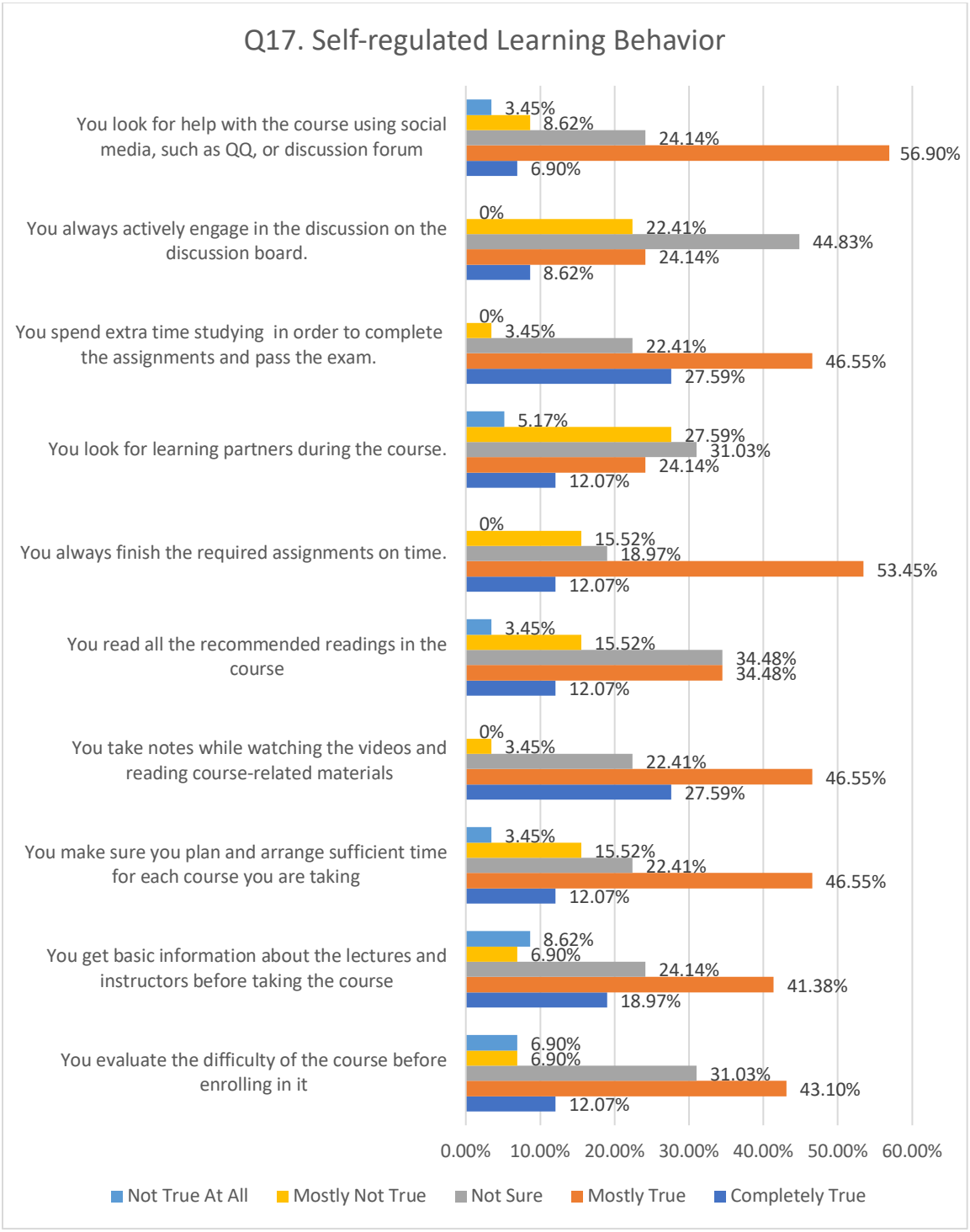


17.以下陈述是否正确? [矩阵单选题]
How true are the following statements?

题目\选项 Options	完全正确 Completely True	大部分是正确的 Mostly true	不确定 Not Sure	大多数不是真实的 Mostly not true	根本不是 Not true at all
您在注册之前先评估课程的难度是否适合自己 You evaluate the difficulty of the course before enrolling in it	7(12.07%)	25(43.10%)	18(31.03%)	4(6.90%)	4(6.90%)
在参加课程之前,您会先阅读有关	11(18.97%)	24(41.38%)	14(24.14%)	4(6.90%)	5(8.62%)

讲座和讲师的基本信息 You get basic information about the lectures and instructors before taking the course					
您计划和安排好时间以确保有足够的时间去学习每门课程 You make sure you plan and arrange sufficient time for each course you are taking	7(12.07%)	27(46.55%)	13(22.41%)	9(15.52%)	2(3.45%)
您会在观看视频和阅读课程相关资料的同时记录笔记 You take notes while watching the videos and reading course-related materials	16(27.59%)	27(46.55%)	13(22.41%)	2(3.45%)	0(0%)
您阅读所有推荐的阅读材料 You read all the recommended readings in the course	7(12.07%)	20(34.48%)	20(34.48%)	9(15.52%)	2(3.45%)
您总是按时完成所要求的作业 You always finish the required	7(12.07%)	31(53.45%)	11(18.97%)	9(15.52%)	0(0%)

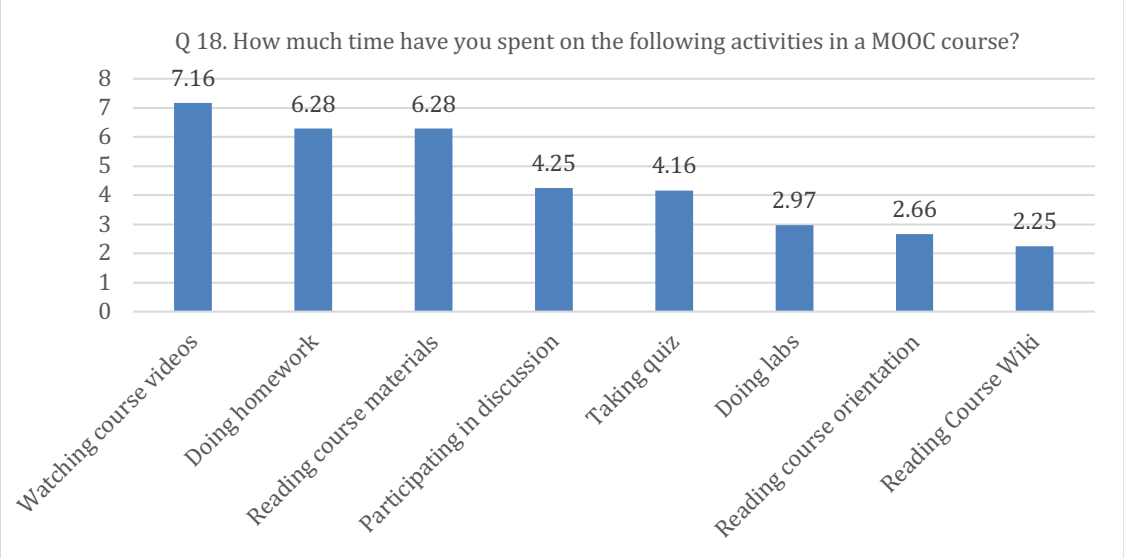
assignments on time.					
您会在课程学习期间寻找学习伙伴 You look for learning partners during the course.	7(12.07%)	14(24.14%)	18(31.03%)	16(27.59%)	3(5.17%)
您会花额外的时间学习,以完成作业,并通过考试。 You spend extra time studying in order to complete the assignments and pass the exam. You always actively engage in the discussion on the discussion board.	16(27.59%)	27(46.55%)	13(22.41%)	2(3.45%)	0(0%)
您总是积极参与讨论板上的讨论 You always actively engage in the discussion on the discussion board.	5(8.62%)	14(24.14%)	26(44.83%)	13(22.41%)	0(0%)
您会使用社交媒体(如 QQ)或讨论区寻求帮助 You look for help within the course using social media, such as QQ, or discussion forum	4(6.90%)	33(56.90%)	14(24.14%)	5(8.62%)	2(3.45%)


Q17. Self-regulated Learning Behavior
You look for help with the course using social media, such as QQ, or discussion forum
3.45%
8.62%
24.14%
56.90%
6.90%
You always actively engage in the discussion on the discussion board.
0%
22.41%
44.83%
24.14%
8.62%
You spend extra time studying in order to complete the assignments and pass the exam.
0%
3.45%
22.41%
46.55%
27.59%
You look for learning partners during the course.
5.17%
27.59%
31.03%
24.14%
12.07%
You always finish the required assignments on time.
0%
15.52%
18.97%
53.45%
12.07%
You read all the recommended readings in the course
3.45%
15.52%
34.48%
34.48%
12.07%
You take notes while watching the videos and reading course-related materials
0%
3.45%
22.41%
46.55%
27.59%
You make sure you plan and arrange sufficient time for each course you are taking
3.45%
15.52%
22.41%
46.55%
12.07%
You get basic information about the lectures and instructors before taking the course
8.62%
6.90%
24.14%
41.38%
18.97%
You evaluate the difficulty of the course before enrolling in it
6.90%
6.90%
31.03%
43.10%
12.07%
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
Not True At All
Mostly Not True
Not Sure
Mostly True
Completely True

18.您在 MOOC 课程学习过程中实际花费了多少时间进行以下活动?请从最长的时间到最短的时间排列: [排序题]

How much time have you spent on the following activities in a MOOC course? Please order it from the longest time to the shortest time.

选项 Options	平均综合得 Average Ratings	
观看课程视频 Watching course videos	7.16	
做作业 Doing homework	6.28	
阅读课程材料 Reading course materials	6.28	
参与讨论 Participating in discussion	4.25	
参加测验 Taking quiz	4.16	
做实验室 Doing labs	2.97	
阅读课程介绍 Reading course orientation	2.66	
阅读课程维基(wiki) Reading Course Wiki	2.25	



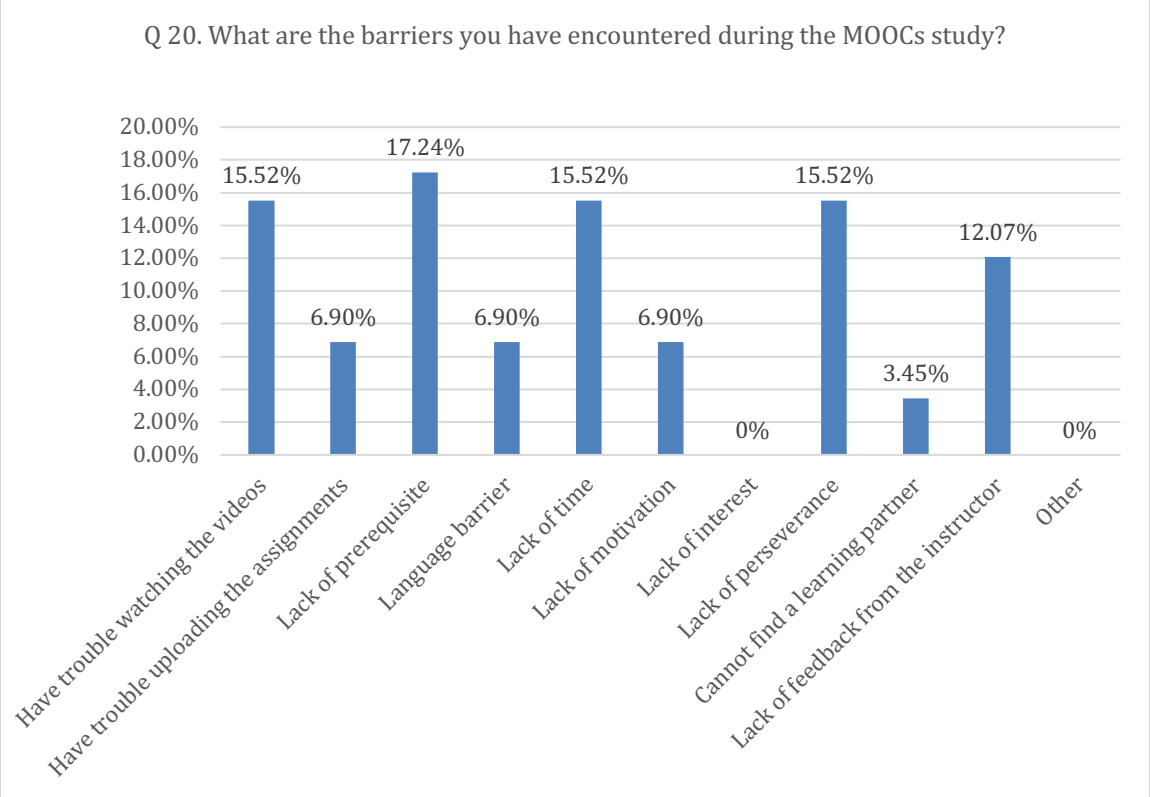
The Question 19 is an open question asking about the top three activities that the participants prefer spending most time in a MOOC course. The top activities the participated filled in are:

- Watching course videos/listening to instruction;
- Reading course materials;
- Taking notes;
- Doing homework and labs;
- Participating in course discussion;
- Reviewing course materials;
- Taking quiz.

20. 您在 MOOC 学习过程中遇到的最大障碍是什么? [单选题]
What are the barriers you have encountered during the MOOCs study?

选项 Options	小计 Total	比例 Percentage
无法观看视频 Have trouble watching the videos	9	15.52%
无法上传作业 Have trouble uploading the assignments	4	6.90%
缺乏必要的预备知识和技能 Lack of prerequisite	10	17.24%
语言障碍 Language barrier	4	6.90%
时间不够 Lack of time	9	15.52%
缺乏动力 Lack of motivation	4	6.90%
缺乏兴趣 Lack of interest	0	0%

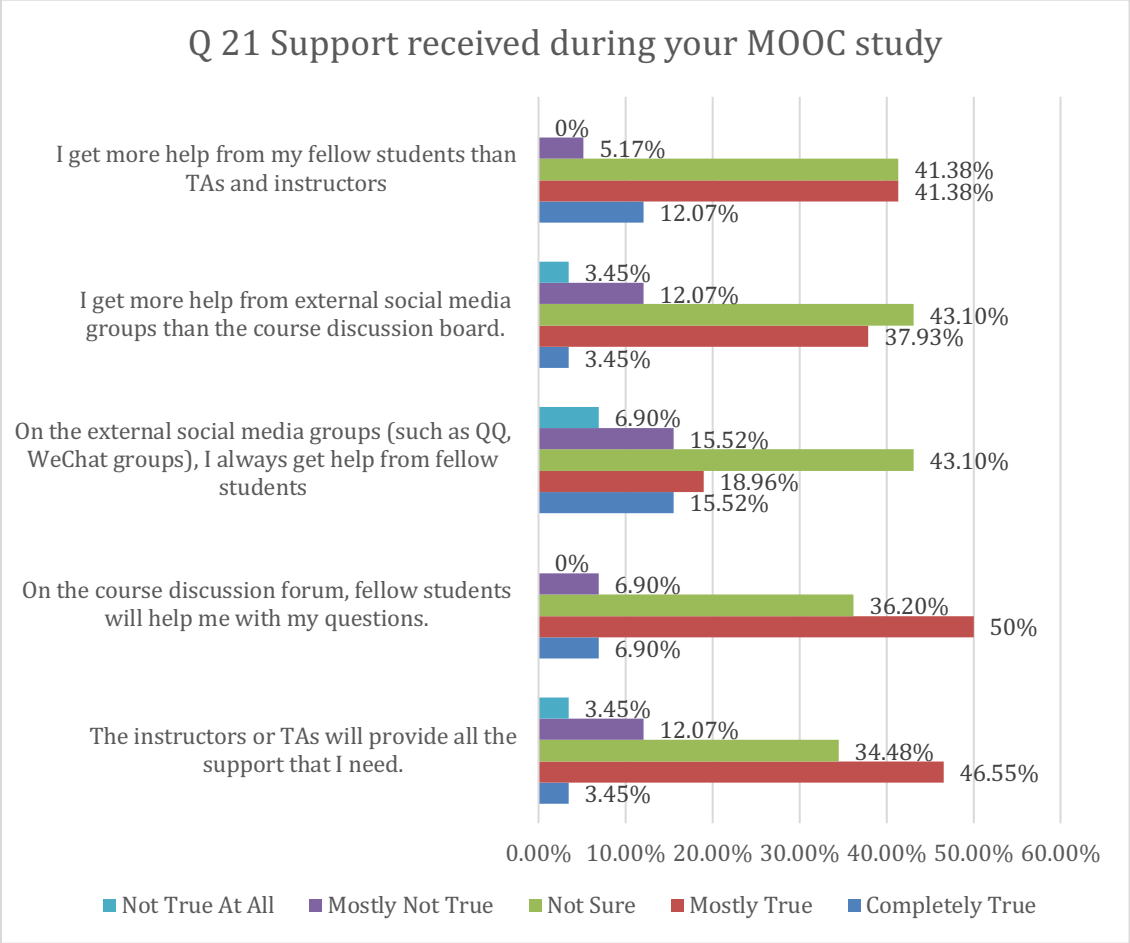
缺乏毅力 Lack of perseverance	9	15.52%
找不到学习伙伴 Cannot find a learning partner	2	3.45%
缺乏来自老师的反馈 Lack of feedback from the instructor	7	12.07%
其他 Other	0	0%



21.以下关于您在 MOOC 学习期间获得支持的陈述正确吗? [矩阵单选题]
How true are the following statements about the support you received during your MOOCs study?

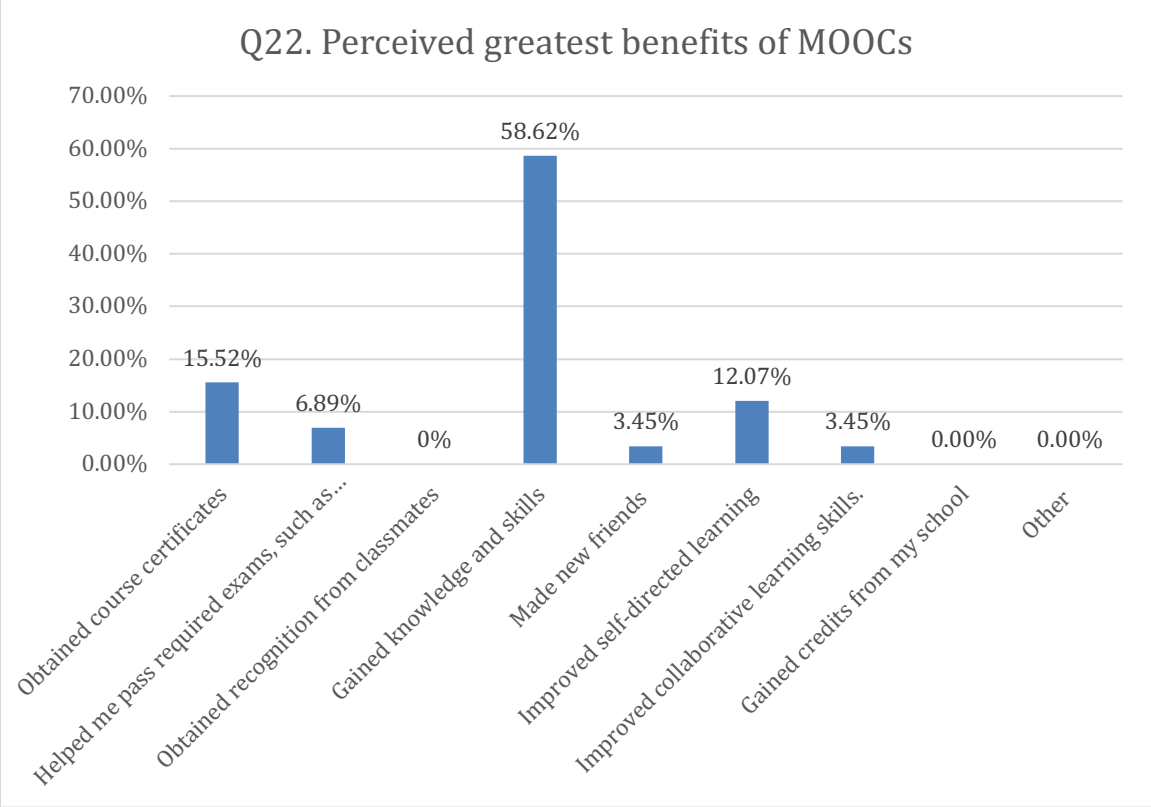
题目\选项 The support you received	完全正确 Completely True	大部分是正确的 Mostly True	不确定 Not Sure	大多数情况下不是正确的 Mostly not true	根本不是真的 Not true at all
导师或助教提供我需要的所有支持 The instructors or TAs will provide all the support that I need.	2(3.45%)	27(46.55%)	20(34.48%)	7(12.07%)	2(3.45%)
在课程讨论论坛上,同学们会帮我解答我的问题 On the course discussion forum, fellow students will help me with my questions.	4(6.90%)	29(50%)	21(36.2%)	4(6.90%)	0(0%)
在外部社交媒体(如QQ,微信群)上,我总是得到同学们的帮助 On the external social media groups (such as QQ, WeChat groups), I always get help from fellow students	9(15.52%)	11(18.96%)	25(43.1%)	9(15.52%)	4(6.90%)
我从外部社交媒体组获得更多的帮助,而不是课程讨论板 I get more help from external social media groups than the course discussion board.	2(3.45%)	22(37.93%)	25(43.10%)	7(12.07%)	2(3.45%)

我从同学那里得到了比助教和导师更多的帮助 I get more help from my fellow students than TAs and instructors	7(12.07%)	24(41.38%)	24(41.38%)	3(5.17%)	0(0%)



22.通过参加 MOOC 课程,您获得的最大收益是什么? [单选题]
What are the greatest benefits you received by taking MOOCs courses?

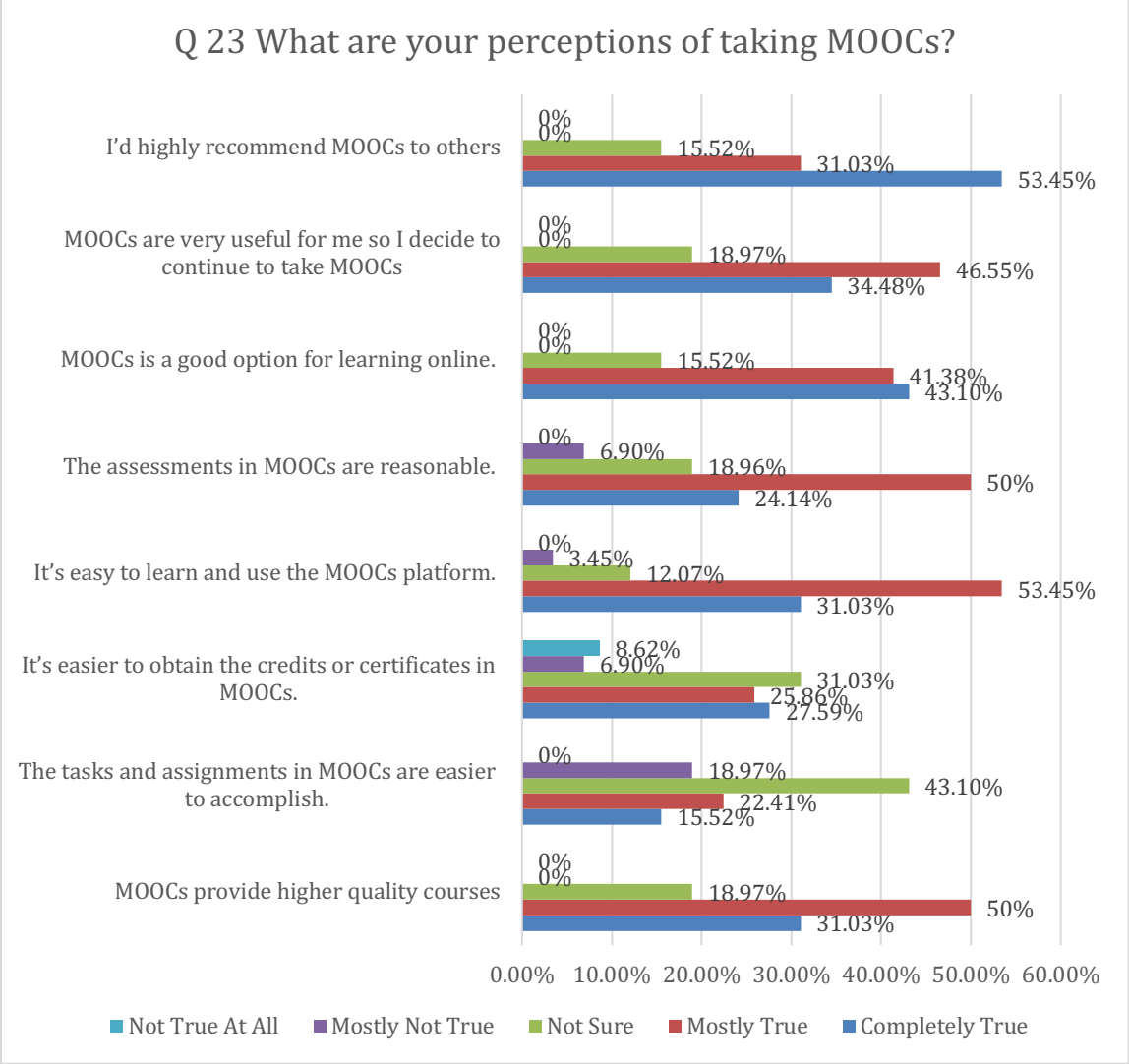
选项	小计	比例
获得课程证书 Obtained course certificates	9	15.52%
帮助我通过必修考试,如 CET Helped me pass required exams, such as CET	4	6.89%
获得同学的认可 Obtained recognition from classmates	0	0%
获得知识和技能 Gained knowledge and skills	34	58.62%
结交新朋友 Made new friends	2	3.45%
改进的自主学习 Improved self-directed learning	7	12.07%
提高协作学习技能 Improved collaborative learning skills	2	3.45%
从我的学校获得学分 Gained credits from my school	0	0%
其他 Other	0	0%
本题有效填写人次 Number of valid answers	58	



23.您对 MOOC 有什么看法? [矩阵单选题]
What are your perceptions of taking MOOCs?

题目\选项 Your perception	完全正确 Completely True	大部分是正确的 Mostly True	不确定 Not Sure	大部分是不正确 Mostly Not True	不是真的 Not True at all
MOOC 提供更高质量的课程 MOOCs provide higher quality courses	18(31.03%)	29(50%)	11(18.97%)	0(0%)	0(0%)
MOOC 中的作业和任务更容易完成 The tasks and assignments in MOOCs are easier to accomplish.	9(15.52%)	13(22.41%)	25(43.10%)	11(18.97%)	0(0%)

在 MOOCs 中获得学分或证书比较容易 It's easier to obtain the credits or certificates in MOOCs.	16(27.59%)	15(25.86%)	18(31.03%)	4(6.90%)	5(8.62%)
学习和使用 MOOC 平台很容易 It's easy to learn and use the MOOCs platform.	18(31.03%)	31(53.45%)	7(12.07%)	2(3.45%)	0(0%)
MOOC 中的评分是合理的 The assessments in MOOCs are reasonable.	14(24.14%)	29(50%)	11(18.96%)	4(6.90%)	0(0%)
MOOC 是在线学习的好选择 MOOCs is a good option for learning online.	25(43.10%)	24(41.38%)	9(15.52%)	0(0%)	0(0%)
MOOC 对我非常有用,所以我决定继续学习 MOOC 课程 MOOCs are very useful for me so I decide to continue to take MOOCs	20(34.48%)	27(46.55%)	11(18.97%)	0(0%)	0(0%)
我强烈推荐 MOOCs 给其他人 I'd highly recommend MOOCs to others	31(53.45%)	18(31.03%)	9(15.52%)	0(0%)	0(0%)



24. 您对西方 MOOC 有何意见和建议？What other feedback or suggestions do you have for western MOOCs?

A total of 25 students provided comments, which fall into the following themes:

1. Create more MOOCs in liberal arts subjects.
2. Lower the difficulty level of engineering courses since there are too few beginner courses.

3. Provide a clearer roadmap of the curriculum, eg., prerequisites for the course; post-course materials, etc.
4. Add activities that can increase interaction and communication with the instructor and teaching assistants, for example, more office hours, or QA sessions. Add Chinese teaching assistants to the courses.
5. Improve the quality of the closed captioning for the videos.
6. Translate more MOOCs into Chinese.
7. Integrate MOOC credentialing with university credits so that they don't have to waste time on some lower-quality courses their universities offer.

25.您有兴趣参加本研究的后续访谈吗? [单选题]
Would you be interested in participating in follow-up interviews?

选项 Options	小计 Total	比例 Percentage
是(请提供您的电子邮件地址) Yes, Please provide your email address	33	56.90%
否 No	25	43.10%
本题有效填写人次 Number of valid answers	58	

BIBLIOGRAPHY

Agarwal, A. (2013). Why massive open online courses (still) matter? *TED Talk 2013*. Retrieved from https://www.ted.com/talks/anant_agarwal_why_massively_open_online_courses_still_matter

Alario Hoyos, C., Pérez Sanagustín, M., Cormier, D., & Delgado Kloos, C. (2014). Proposal for a conceptual framework for educators to describe and design MOOCs.

Allen, I. E., & Seaman, J. (2013). *Changing course: Ten years of tracking online education in the United States*. Sloan Consortium. PO Box 1238, Newburyport, MA 01950.

Allen, I. E., & Seaman, J. (2015). *Grade Level: Tracking Online Education in the United States.* Babson Survey Research Group.

Ally, M. (2008). Multimedia information design for mobile devices. In *Multimedia Technologies: Concepts, Methodologies, Tools, and Applications* (pp. 607-614). IGI Global.

Anderson, T. (2003). Getting the mix right again: An updated and theoretical rationale for interaction. *The International Review of Research in Open and Distributed Learning*, *4*(2).

Arbaugh, J. B. (2010). *Online and blended business education for the 21st century: Current research and future directions*. Elsevier.

Artino, A. R. (2008). Motivational beliefs and perceptions of instructional quality: Predicting satisfaction with online training. *Journal of Computer Assisted Learning*, *24*(3), 260-270.

Baggaley, J. (2013). MOOC rampant. *Distance Education*, *34*(3), 368-378.

Bangert, A. (2008). The influence of social presence and teaching presence on the quality of online critical inquiry. *Journal of Computing in Higher Education*, *20*(1), 34-61.

Bekele, T. A. (2010). Motivation and satisfaction in internet-supported learning environment: A review. *Journal of Educational Technology & Society*, *13*(2), 116.

Bird, J., & Morgan, C. (2003). Adults contemplating university study at a distance: Issues, themes and concerns. *The International Review of Research in Open and Distributed Learning*, *4*(1).

Blaine, C. K. (2010). Student persistence in traditional and distance learning courses at two community colleges. (Doctoral dissertation). Retrieved from http://repository. upenn.edu/dissertations/AAI3414206/

Bonvillian, W. B., & Singer, S. R. (2013). The online challenge to higher education. *Issues in Science and Technology*, *29*(4), 23-30.

Borras-Gene, O., Martinez-Nunez, M., & Fidalgo-Blanco, Á. (2016). New challenges for the motivation and learning in engineering education using gamification in MOOC. *International Journal of Engineering Education*, *32*(1), 501-512.

Bremer, C. (2012). New format for online courses: The open course future of learning. *Proceedings of eLearning Baltics eLBa 2012*, 63-90.

Brown, M. (2013). Moving into the post-MOOC era. *2014-04-05]. http://www. educause. edu/blogs/mbbrown/moving-post-mooc-era*.

Bruff, D. O., Fisher, D. H., McEwen, K. E., & Smith, B. E. (2013). Wrapping a MOOC: Student perceptions of an experiment in blended learning. *Journal of Online Learning and Teaching*, *9*(2), 187.

Calter, M. (2013). MOOCs and the library: Engaging with evolving pedagogy. Retrieved from http://library.ifla.org/160/1/098-calter-en.pdf

Carey, K. (2012, August 23rd). The MOOC-led meritocracy. *The Chronicle of Higher Education*, *29*.

Casey, G., & Evans, T. (2011). Designing for learning: Online social networks as a classroom environment. *The International Review of Research in Open and Distributed Learning*, *12*(7), 1-26.

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

Clayton, K., Blumberg, F., & Auld, D. P. (2010). The relationship between motivation, learning strategies and choice of environment whether traditional or including an online component. *British Journal of Educational Technology*, *41*(3), 349-364.

Coates, K. (2013). The re-invention of the academy: How technologically mediated learning will–and will not–transform advanced education. In *International Conference on Hybrid Learning and Continuing Education* (pp. 1-9). Springer, Berlin, Heidelberg.

Coffrin, C., Corrin, L., de Barba, P., & Kennedy, G. (2014). Visualizing patterns of student engagement and performance in MOOCs. In *Proceedings of the fourth international conference on learning analytics and knowledge* (pp. 83-92). ACM.

Cohen, A., & Holstein, S. (2018). Analysing successful massive open online courses using the community of inquiry model as perceived by students. *Journal of Computer Assisted Learning*.

Cole, R. A. (Ed.). (2000). *Issues in Web-based pedagogy: A critical primer*. Greenwood Publishing Group.

Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced mixed methods research designs. *Handbook of mixed methods in social and behavioral research*, 209-240.

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. Sage Publications.

Cusumano, M. A. (2013). Are the costs of 'free' too high in online education? *Communications of the ACM*, *56*(4), 26-28.

Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media in Education*, *2012*(3).

Deng, Y., Wang, Y., Li, D., Yu, Y, & He, G. (2017). Educational innovation and practices based on a MOOC flipped classroom: GPS Theory and Application. *Surveying and Mapping Engineering,* 2017(2), 76-80.

Ebben, M., & Murphy, J. S. (2014). Unpacking MOOC scholarly discourse: a review of nascent MOOC scholarship. *Learning, Media and Technology*, *39*(3), 328-345.

Fan, W. (2012). Massive Open Online Course (MOOC) and its learning support based on connectivism. *Distance Education Journal, 3*(3), 1-36.

Farajollahi, M., Hosein, Z. A. R. E., Hormozi, M., Sarmadi, M. R., & Zarifsanaee, N. (2010). A conceptual model for effective distance learning in higher education. *Turkish Online Journal of Distance Education*, *11*(3).

Fauser, M., Henry, K., & Norman, D. K. (2006). Comparison of alternative instructional design models. *Online] Retrieved on June*, *22*, 2015.

Fidalgo-Blanco, Á., Sein-Echaluce, M. L., & García-Peñalvo, F. J. (2016). From massive access to cooperation: lessons learned and proven results of a hybrid xMOOC/cMOOC pedagogical approach to MOOCs. *International Journal of Educational Technology in Higher Education*, *13*(1), 24.

Fini, A. (2009). The technological dimension of a massive open online course: The case of the CCK08 course tools. *The International Review of Research in Open and Distributed Learning*, *10*(5).

Fontana, R. P., Milligan, C., Littlejohn, A., & Margaryan, A. (2015). Measuring self-regulated learning in the workplace. *International Journal of Training and Development*, *19*(1), 32-52.

Fournier, H., Kop, R., & Sitlia, H. (2011). The value of learning analytics to networked learning on a personal learning environment. In *Proceedings of the 1st International Conference on Learning Analytics and Knowledge* (pp. 104-109). ACM.

Fox, A. (2013). What Was It Like to Teach a MOOC. *2015-01-31]. http://teaching. berkeley. edu/node/1332*.

Frymier, A. B., & Shulman, G. M. (1995). "What's in it for me?": Increasing content relevance to enhance students' motivation. *Communication Education*, *44*(1), 40-50.

Gaebel, M. (2013). MOOCs massive open online courses. *EUA Occasional papers*.

García-Peñalvo, F. J., Fidalgo-Blanco, Á., & Sein-Echaluce, M. L. (2017). An adaptive hybrid MOOC model: Disrupting the MOOC concept in higher education. *Telematics and Informatics*.

Garrison, D. R., & Archer, W. (2000). *A Transactional Perspective on Teaching and Learning: A Framework for Adult and Higher Education. Advances in Learning and Instruction Series*. Elsevier Science, Inc., New York, NY

Garrison, D. R. (2007). Online community of inquiry review: Social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks*, *11*(1), 61-72.

Garrison, D. R., Anderson, T., & Archer, W. (2010). The first decade of the community of inquiry framework: A retrospective. *The Internet and Higher Education*, *13*(1-2), 5-9.

Garrison, D. R., Cleveland-Innes, M., & Fung, T. S. (2010). Exploring causal relationships among teaching, cognitive and social presence: Student perceptions of the community of inquiry framework. *The Internet and Higher Education*, *13*(1-2), 31-36.

Garrison, D. R. (2011). *E-learning in the 21st century: A framework for research and practice*. Taylor & Francis.

Gasevic, D., Kovanovic, V., Joksimovic, S., & Siemens, G. (2014). Where is research on massive open online courses headed? A data analysis of the MOOC Research Initiative. *The International Review of Research in Open and Distributed Learning*, *15*(5).

Giannakos, M. N., Chorianopoulos, K., Ronchetti, M., Szegedi, P., & Teasley, S. D. (2013, April). Analytics on video-based learning. In *Proceedings of the Third International Conference on Learning Analytics and Knowledge* (pp. 283-284). ACM.

Gil, P., Candelas-Herías, F. A., Garcia, G. J., & Jara, C. A. (2012). Open educational resources: the role of OCW, blogs and videos in computer network classrooms. *International Journal of Emerging Technologies in Learning*, *7*(3), 4–10.

Goel, A., & Joyner, D. (2017). Using AI to teach AI. *AI Magazine*.

Graham, S., & Weiner, B. (1996). Theories and principles of motivation. *Handbook of Educational Psychology*, *4*, 63-84.

Gunawardena, C. N. (1995). Social presence theory and implications for interaction and collaborative learning in computer conferences. *International Journal of Educational Telecommunications*, *1*(2), 147-166.

Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American Journal of Distance Education*, *11*(3), 8-26.

Gustafson, K. L., & Branch, R. M. (2002). What is instructional design. *Trends and Issues in Instructional Design and Technology*, 16-25.

Hakami, N., White, S., & Chakaveh, S. (2017). Motivational Factors that Influence the use of MOOCs: Learners' Perspectives. *Computer Supported Education (CSEDU 2017), 323-331*

Hao, X., & Zhang, Q. (2015). Flipped classroom education: experience+ trend. *China College Education, 10*, 65-67.

Hart, C. (2012). Factors associated with student persistence in an online program of study: A review of the literature. *Journal of Interactive Online Learning*, *11*(1), 19-42.

Hartnett, M., George, A. S., & Dron, J. (2011). Examining motivation in online distance learning environments: Complex, multifaceted and situation-dependent. *The International Review of Research in Open and Distributed Learning*, *12*(6), 20-38.

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

Hodgson, P., Kajimoto, M., & Hui, B. (2017). The Social Presence of Active Learners across Five Countries through MOOCs: From Single to Super Postings. *International Journal for Infonomics, 10*(4), 1390–1397.

Holder, B. (2007). An investigation of hope, academics, environment, and motivation as predictors of persistence in higher education online programs. *The Internet and Higher Education*, *10*(4), 245-260.

Hood, N., Littlejohn, A., & Milligan, C. (2015). Context counts: How learners' contexts influence learning in a MOOC. *Computers & Education*, *91*, 83-91.

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.

Ji, K., Zhang, H., Tang, B., & Liu, P. (2015). Practice of MOOC and flipped classroom education. *Higher Education Research Journal, 38*(4), 47-52.

Johnson, R. D., Hornik, S., & Salas, E. (2008). An empirical examination of factors contributing to the creation of successful e-learning environments. *International Journal of Human-Computer Studies*, *66*(5), 356-369.

Kanuka, H. (2011). Interaction and the online distance classroom: Do instructional methods effect the quality of interaction? *Journal of Computing in Higher Education*, *23*(2-3), 143-156.

Kassabian, D. (2014). *Massive Open Online Courses (MOOCs) at elite, early-adopter universities: Goals, progress, and value proposition*. Doctoral dissertation, University of Pennsylvania. Retrieved from https://repository.upenn.edu/dissertations/AAI3635748/

Kauffman, Y., & Kauffman, D. (2015, June). MOOCs design and development: Using active learning pedagogy and instructional design model in MITx courses on the edX platform. In *EdMedia: World Conference on Educational Media and Technology* (pp. 22-27). Association for the Advancement of Computing in Education (AACE).

Keller, J. M. (2010). Challenges in learner motivation: A holistic, integrative model for research and design on learner motivation. In *The 11th International Conference on Education Research*.

Kennedy, J. (2014). Characteristics of massive open online courses (MOOCs): A research review, 2009-2012. *Journal of Interactive Online Learning*, *13*(1).

Kizilcec, R. F., Saltarelli, A. J., Reich, J., & Cohen, G. L. (2017). Closing global achievement gaps in MOOCs. *Science*, *355*(6322), 251-252.

Klein, H. J., Noe, R. A., & Wang, C. (2006). Motivation to learn and course outcomes: The impact of delivery mode, learning goal orientation, and perceived barriers and enablers. *Personnel Psychology*, *59*(3), 665-702.

Kolić-Vehovec, S., Rončević, B., & Bajšanski, I. (2008). Motivational components of self-regulated learning and reading strategy use in university students: The role of goal orientation patterns. *Learning and Individual Differences*, *18*(1), 108-113.

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 Distance Learning, Special Issue - Connectivism: Design and Delivery of Social Networked Learning,*, *12*(3), 19-37. Retrieved from nparc.cisti-icist.nrc-cnrc.gc.ca/npsi/ctrl?action=rtdoc&an=18150443&lang=fr

Kop, R., Fournier, H., & Mak, J. S. F. (2011). A pedagogy of abundance or a pedagogy to support human beings? Participant support on massive open

online courses. *The International Review of Research in Open and Distributed Learning*, *12*(7), 74-93.

Kovanović, V., Gašević, D., Hatala, M., & Siemens, G. (2017). A novel model of cognitive presence assessment using automated learning analytics methods. *Vitomir Kovanovic*, 13.

Kruiderink, N. (2013). Open buffet of higher education. *Trend report: Open educational resources*, *54*.

Kupczynski, L., Ice, P., Wiesenmayer, R., & McCluskey, F. (2010). Student perceptions of the relationship between indicators of teaching presence and success in online courses. *Journal of Interactive Online Learning*, *9*(1).

Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. *The Internet and Higher Education*, *29*, 40-48.

Liu, C. (2015). The development of MOOCs from the perspectives of open universities. *Adult Education,* (4), 66-67.

Liu, J. (2016). The construction and experimental research of MOOC flipped classroom—using Martial Arts elective course as an example. *Sports Education Journal, 2016*(2), 121-123.

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

Lunce, L. M., & Huang, X. (2013). Situational Awareness and Online Instruction: A Perspective for Instructional Designers. *Journal of Applied Learning Technology*, *3*(3).

MacIsaac, P. (2012). What a librarian can bring to your open online course development team. *EDUCAUSE, 2012*. Retrieved from http://auspace.athabascau.ca:8080/bitstream/2149/3218/2/MacIsaac_MOOC

Marques, J., & McGuire, R. (2013). What is a massive open online course anyway? MN+ R attempts a definition. *MOOC News & Reviews*.

Martens, R., Gulikers, J., & Bastiaens, T. (2004). The impact of intrinsic motivation on e-learning in authentic computer tasks. *Journal of Computer Assisted Learning*, *20*(5), 368-376.

Maull, K. E., Saldivar, M. G., & Sumner, T. (2010). Online curriculum planning behavior of teachers. In *Educational Data Mining 2010*.

McAndrew, P. (2013). Learning from open design: running a learning design MOOC. *ELearning Papers*, (33).

McWhaw, K., & Abrami, P. C. (2001). Student goal orientation and interest: Effects on students' use of self-regulated learning strategies. *Contemporary Educational Psychology*, *26*(3), 311-329.

Meyer, D. K., & Turner, J. C. (2006). Re-conceptualizing emotion and motivation to learn in classroom contexts. *Educational Psychology Review*, *18*(4), 377-390.

Milligan, C., Littlejohn, A., & Margaryan, A. (2013). Patterns of engagement in connectivist MOOCs. *Journal of Online Learning and Teaching*, *9*(2), 149.

Ministry of Education (2015). *Opinions About Strengthening the Development and Administration of Open Online Courses for Higher Education.* Retrieved from http://old.moe.gov.cn/publicfiles/business/htmlfiles/moe/s7056/201504/186490.html

Miyazoe, T., & Anderson, T. (2010). The interactive equivalency theorem. *Journal of Interactive Online Learning, 9*(2), 94-104. Retrieved from http://www.ncolr.org/issues/jiol/v9/n2

Moore, M., & Kearsley, G. (2005). *Distance education: A systems view* (2nd ed.). Belmont, CA: Wadsworth Cengage Learning.

Moore, M. G., & Kearsley, G. (2011). *Distance education: A systems view of online learning*. Cengage Learning.

Morris, L. V. (2013). MOOCs, emerging technologies, and quality. *Innovative Higher Education*, *38*(4), 251-252.

Nam, C. S., & Smith-Jackson, T. L. (2007). Web-based learning environment: A theory-based design process for development and evaluation. *Journal of Information Technology Education: Research*, *6*, 23-43.

Palloff, R. M., & Pratt, K. (2000). Making the Transition: Helping Teachers To Teach Online. For full text: http://www. educause. edu/conference/e2000/proceedings. html.

Pappano, L. (2012). The Year of the MOOC. *The New York Times*, *2*(12), 2012.

Park, J. H., & Choi, H. J. (2009). Factors influencing adult learners' decision to drop out or persist in online learning. *Educational Technology & Society*, *12*(4), 207-217.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist*, *37*(2), 91-105.

Prensky, M. (2002). The motivation of gameplay: The real twenty-first century learning revolution. *On the Horizon*, *10*(1), 5-11.

Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research*, *31*(6), 459-470.

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451-502). San Diego, CA: Academic Press. http://dx.doi.org/10.1016/B978-012109890-2/50043-3

Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, *16*(4), 385-407.

Qian, L., Wang, X., & Zhao, M. (2015) Key successful factors of MOOC design and strategic analysis- using the ChinaX course series from Harvard University as an example, *China Online Education Research*, 36(8), 23-29.

Ragan, L. C., Bigatel, P. M., Kennan, S. S., & Dillon, J. M. (2012). From research to practice: Towards the development of an integrated and comprehensive faculty development program. *Journal of Asynchronous Learning Networks*, *16*(5), 71-86.

Raghuveer, V. R., & Tripathy, B. K. (2016). Affinity-based learning object retrieval in an e-learning environment using evolutionary learner profile. *Knowledge Management & E-Learning*, *8*(1), 182.

Reigeluth, C. M., Carr-Chellman, A., Beabout, B., & Watson, W. (2009). Creating shared visions of the future for K-12 education: A systemic transformation process for a learner-centered paradigm. In *Learning and Instructional Technologies for the 21st Century* (pp. 1-19). Springer, Boston, MA.

Richardson, J., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks, 7*(1), 68–88.

Rodriguez, C. 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*. Retrieved from http://www.eurodl.org/?p=Special&sp=init2&article=516

Rovai, A. P. (2002). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *The Internet and Higher Education*, *5*(4), 319-332.

Rovai, A. P., Ponton, M. K., Wighting, M. J., & Baker, J. D. (2007). A comparative analysis of student motivation in traditional classroom and e-learning courses. *International Journal on ELearning*, *6*(3), 413.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68.

Sadigh, D., Seshia, S. A., & Gupta, M. (2012). Automating exercise generation: A step towards meeting the MOOC challenge for embedded systems. In *Proceedings of the Workshop on Embedded and Cyber-Physical Systems Education* (p. 2). ACM.

Schunk, D. H. (2005). Self-regulated learning: The educational legacy of Paul R. Pintrich. *Educational Psychologist*, *40*(2), 85-94.

Shah, D. (2018). By the numbers: MOOCs in 2017. *Class Central MOOC Roundup Series 2017*. Retrieved from https://www.class-central.com/report/mooc-stats-2017/

Shea, P., Li, C. S., & Pickett, A. (2006). A study of teaching presence and student sense of learning community in fully online and web-enhanced college courses. *The Internet and Higher Education*, *9*(3), 175-190.

Siemens, G. (2005). Connectivism: Learning as network-creation. *ASTD Learning News*, *10*(1).

Siemens, G. (2012). Massive open online courses as new educative practice. *Blog Elearnspace*. Retrieved from: http://www.elearnspace.org/blog/2012/02/29/massive-open-online-courses-as-new-educative-practice/

Small, R. V., & Gluck, M. (1994). The relationship of motivational conditions to effective instructional attributes: A magnitude scaling approach. *Educational Technology*, *34*(8), 33-40.

Smart, K. L., & Cappel, J. J. (2006). Students' perceptions of online learning: A comparative study. *Journal of Information Technology Education: Research*, *5*, 201-219.

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. *The Internet and Higher Education*, *7*(1), 59-70.

Song, S. H. (2000). Research Issues of Motivation in Web-based Instruction. *Quarterly Review of Distance Education*, *1*(3), 225-29.

Stewart, B. (2013). Massiveness+ openness= new literacies of participation. *Journal of Online Learning and Teaching,* 9(2), 228-238.

Sun, L., & Zhong, S. (2014). A study of peer assessment model in MOOC evaluation system. *Open Education Research, 20*(5), 83-90.

Sun, Z., & Wu. X. (2015). The Research of MOOC flipped classroom and restructuring teaching process. *Adult Education,* (6), 53-56.

Talbert, R. (2012). Inverted classroom. *Colleagues*, *9*(1), 7.

Tang, M. (2015). Can MOOC realize education equality? *China Education Newsletter*. Retrieved from http://www.jyb.cn/theory/zjld/201506/t20150617_626719.html.

Taylor, J. C. (2001). Fifth generation distance education. *Instructional Science and Technology*, *4*(1), 1-14.

Turkle, S. (2005). *The second self: Computers and the human spirit*. MIT Press.

Uvalić-Trumbić, S., & Daniel, J. (2013, September). Making sense of MOOCs: The evolution of online learning in higher education. In *European Conference on Technology Enhanced Learning* (pp. 1-4). Springer, Berlin, Heidelberg.

Veletsianos, G., Collier, A., & Schneider, E. (2015). Digging deeper into learners' experiences in MOOCs: Participation in social networks outside of MOOCs, notetaking and contexts surrounding content consumption. *British Journal of Educational Technology*, *46*(3), 570-587.

Veletsianos, G., & Shepherdson, P. (2016). A systematic analysis and synthesis of the empirical MOOC literature published in 2013–2015. *The International Review of Research in Open and Distributed Learning*, *17*(2).

Vihavainen, A., Luukkainen, M., & Kurhila, J. (2012). Multi-faceted support for MOOC in programming. In *Proceedings of the 13th annual conference on Information technology education* (pp. 171-176). ACM.

Waldrop, M. M. (2013). Campus 2.0. *Nature*, *495*(7440), 160.

Walsh, J. P., Sun, J. C. Y., & Riconscente, M. (2011). Online teaching tool simplifies faculty use of multimedia and improves student interest and knowledge in science. *CBE-Life Sciences Education*, *10*(3), 298-308.

Wang, X., & Qian, L. (2014). How to use the fundamental principles of MOOCs to guide learning activities—using the FSLT12 class from Oxford Brook University as an example. *Modern Educational Technology, 24*(12), 40-44.

Wei, C. W., & Chen, N. S. (2012). A model for social presence in online classrooms. *Educational Technology Research and Development*, *60*(3), 529-545.

Wighting, M. J., Liu, J., & Rovai, A. P. (2008). Distinguishing sense of community and motivation characteristics between online and traditional college students. *Quarterly Review of Distance Education*, *9*(3), 285-295.

Winn, W. (1990). Some implications of cognitive theory for instructional design. *Instructional Science*, 19, 53–69.

Wlodkowski, R. J. (1978). *Motivation and teaching: A practical guide*. National Education Association, Washington, DC

Wolters, C. A., Shirley, L. Y., & Pintrich, P. R. (1996). The relation between goal orientation and students' motivational beliefs and self-regulated learning. *Learning and Individual Differences*, *8*(3), 211-238.

Wu, W. (2013) Massive Open Online Courses (MOOC)- A Review and Analysis of Coursera. *Heilongjiang Education: Higher Education Research and Evaluation,* (2), 39-41.

Xi, H., & Kang, X., (2016). Western MOOC and ideology: cultural challenges and practical reflections. *Higher Education Management, 10*(6), 81-87

Xu, B., Li, T., & Shi, X. (2017). Educational implications from the analysis of learning motivations in MOOC, flipped classroom, and SPOC. *China Online Education*, (9), 47-52.

Yousef, A. M. F., Chatti, M. A., Schroeder, U., & andHarald Jakobs, M. W. (2014). A Review of the State-of-the-Art. In *Proceedings of CSEDU2014, 6th International Conference on Computer Supported Education* (pp. 9-20).

Zeng, M., Zhou, Q., Cai, G., Wang, X., Chen, S., Huang., Y., Dong, J. (2015). Research of the learning models based on MOOCs and flipped classroom. *China Online Education,* (4), 102-108.

Zhan, D. (2016). "College Computer Science" "MOOC+SPOCs+flipped classroom" mixed education innovation. *Computer Science Education*, 2016 (1), 12-16.

Zhang, N., & Xia, M. (2014). Army online educational system design based on MOOCs. *China Educational Technology: Higher Education and Professional Education*, (11), 75-77.

Zhu, M., Sari, A., & Lee, M. M. (2018). A systematic review of research methods and topics of the empirical MOOC literature (2014–2016). *The Internet and Higher Education*.

Zhu, X. & Zhang, L. (2015). MOOC flipped classroom teaching practices. *Technology Vision,* (22), 66-69.

Zimmerman, B. J. (1986). Becoming a self-regulated learner: Which are the key subprocesses? *Contemporary Educational Psychology*, *11*(4), 307-313.

Zimmerman, B. J., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of Educational Psychology*, *82*(1), 51.

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