Comparing MOOCs with Traditional Courses for Quality Teaching in Higher Education

Tong Li\(^1,a,*\) and Nan YANG\(^2,b\)

\(^1\)Faculty of Information Technology, Beijing University of Technology, Beijing, China

\(^2\)Institute of Higher Education, Beijing Academy of Educational Sciences, Beijing, China

\(^a\)litong@bjut.edu.cn, \(^b\)yangnan@bjaes.cn

*Corresponding author

Keywords: MOOCs, Quality Teaching, Higher Education.

Abstract. As the rapid development of modern technology, MOOCs have gained increasing attention from both academia and industry. Some researchers and practitioners have considered MOOCs as a disruptive innovation in higher education, having the potential of replacing traditional courses, while others insist on traditional courses. In this paper, we take a closer look at this topic and aim to figure out the interrelationship between MOOCs and traditional courses based on quality teaching framework. In particular, we adopt a goal modeling technique to systematically refine the objective of quality teaching, and analyze how MOOCs and traditional courses contribute to the achievement of quality teaching. Based on such analysis, we finally come to the conclusion that MOOCs and traditional courses are all indispensable parts for quality teaching, complementing each other.

Introduction

MOOCs (Massive Open Online Courses) have been a buzzword in higher education since 2012. It was considered as a disruptive innovation in higher education as it creates an entirely new market that offers flexibility, affordable access and fast-track completion at a low cost for those people who are interested in learning\(^1\). However, some researchers worry that MOOCs might destroy academia as its popularity is mainly attributed to its lower costs instead of technology’s intrinsic educational value\(^2\).

Nowadays quality becomes more and more important in the era of mass higher education. Quality teaching is the core part of quality in higher education\(^3\). This paper first reviews the impact of MOOCs on higher education based on existing literatures. Second, we present several essential components that lead to quality teaching based on previous study and existing literature. Thirdly, we adopt goal modeling technique to understand the role of MOOCs in quality teaching by comparing them with traditional courses. This paper indicates MOOCs neither the panacea of quality teaching in higher education nor the genie out of the bottle. It might be a supplemental element in the traditional courses to assure quality teaching.

The Impacts of MOOCs on Higher Education

MOOCs have both positive impacts and negative impacts on higher education. The most obvious positive impact of MOOCs on higher education is to address the inequality of higher education. MOOCs, as free open online courses, are mainly offered by elite universities, providing so-called quality educational resources to people all over the world. For those who might not be capable of enrolling in outstanding universities, they are free to register to MOOCs offered by their ideal higher educational institutions. MOOCs are also an important stage of Open Educational Resources (OERs), because they provide not only free resources but also ‘quasi-service’ for student learning. Furthermore, MOOCs have the potential to transform higher education’s organizational structures, i.e., breaking the monopoly held by traditional colleges and universities over courses and credits\(^4\).
Beside these positive impacts in a macro level of higher education, they also benefit in a micro level of higher education, i.e., quality teaching. Firstly, MOOCs make tracking individual learning behavior and learning analytics possible by recording students’ every mouse click. As Roy Pea, Professor of Education and Learning Sciences at Stanford University, mentioned “we can have microanalytics on every paper, every test, right down to what media each student prefers”[4]. Secondly, MOOCs has the potential to check students’ understanding in the learning process and to assist students to find answers to their questions efficiently with proper integration of technologies. For example, the co-founder of Coursera Daphne Koller segments lectures into 8-10-minute video with a quiz, thus, learners are able to reflect on what they had learnt, which facilitates a better retention of the learning materials[4]. Another example is the implementation of a real-time search algorithm that would display related questions and answers before a student could finish typing in the forum of MOOCs[4].

Negative impacts of MOOCs on higher education can also be divided into two levels: macro level and micro level. In the macro level, firstly, MOOCs might be the neocolonialism as the content of MOOCs is mainly based on the American academic experience and pedagogical ideas, especially in fields such as literature and philosophy. It reflects western trends and will strengthen the hegemony of western methodologies and orientation[5]. Secondly, MOOCs promote centralized knowledge production, which might limit the spillover effects of building academic infrastructures in the developing countries[4]. In the micro level, the most frequently mentioned issue is high dropout rate. Scholars argue the percentage of registered learners completing the courses is very small[6][7][4]. Besides, MOOCs are also criticized by its low quality of interaction[8]. The reason for low quality of interaction in MOOCs is that they are developed due to the possibilities of lower costs[2]. The business model of MOOCs is freemium, which relies on variable cost minimization (VCM)[8]. In the case of MOOCs, variable costs are those cost of service provided by teachers to serve students such as interaction with students, timely feedback provision and learning evaluation, etc. On the one hand, MOOCs usually have a very large of cohort such as thousands of students. MOOCs mainly reply on peer interaction rather than teachers’ direct interaction with individual student. On the other hand, teaching presence is an essential element of quality learning experience in online education according to the framework of Community of Inquiry[9]. Thus, unless participants in MOOCs have very strong learning motivations to continue their study, they will quit in the middle of courses, which explains the reason for high dropout rate in MOOCs.

Quality Teaching in Higher Education

Quality teaching is at the heart of quality higher education[3]. Quality teaching targets learning rather than teaching itself. Quality teaching is a very complex issue[10]. Among various elements that contribute to quality teaching, we think the following three elements are very essential: content, process and evaluation.

For learning content, it requires teachers to organize learning contents in a meaningful way in order to support learners in constructing the new knowledge in relation to their prior knowledge. Students will learn more effectively when they put the knowledge in their own structure of knowledge rather than receiving separate materials or information[11][12][13].

For learning process, quality teaching facilitates motivation, engagement, and feedback. Motivation can be divided into intrinsic and extrinsic. Students are intrinsically motivated if they are interested in the contents of their learning or in the process of learning itself. Students are extrinsically motivated if they get rewards from academic study[13]. Quality teaching enhances students’ intrinsic motivation by such as displaying teachers’ own enthusiasm to share the learning subject with students[14] and enhances the extrinsic motivation by providing guidance and feedback through formative assessment in the learning process[15]. Engagement is the action of being involved in the learning activities[16]. Quality teaching facilitates engagement by supporting student-student interaction, teacher-student interaction, and student-content interaction[19]. Feedback is a crucial element for learning in any educational level. In higher education, students learn to become
professional specialists. The teaching and learning process can be seen as the conception matching between experts (instructors) and learners through a dialogue or conversation\textsuperscript{[17-19]}. Feedback helps revealing the gap between the experts’ conception and students’ conception. Therefore, quality teaching requires teachers to provide feedback to students in the teaching and learning process\textsuperscript{[20]}. For evaluation, quality teaching requires the method of evaluation targets the intended learning outcome. The way how teachers evaluate student learning largely influences the way how students to learn. Two learning approaches were discovered by Marton and Säljö in 1976\textsuperscript{[21]}: deep learning and surface learning. In the approach of deep learning, students intend to extract meaning for themselves and engage with the subject actively and reach a thorough understanding of the subject. In the approach of surface learning, students intend to extract meaning for externals such as exams and concerns with trying to remember the answers for questions. Thus, quality teaching requires teachers to design the evaluation for students’ deep learning.

Comparing MOOCs and Traditional Courses

In this section, we compare MOOCs and traditional courses in detail based on the aforementioned quality teaching framework. In particular, we leverage a goal modeling language \textit{iStar}\textsuperscript{[22]} to model and analyze how these two teaching paradigms contribute to the objective of quality teaching.

\textit{iStar} is a goal-based modeling language, which was invented to model and analyze stakeholder’s requirements in the early stage of software engineering. Our intention of adopting this technique is to analyze the “\textit{requirements for achieving quality teaching}”. The conceptual model of \textit{iStar} allows us to decompose the objective of quality teaching (i.e., the root goal) into fine-grained sub-goals, and to further analyze how alternative solutions contribute to the satisfaction of the root goal. Specifically, as shown in Fig.1, our analysis mainly involves four types of entities and relations:

- \textit{Quality goals} specify how well a system shall perform its functions (activities), which can be vague. Thus, achieving quality teaching can appropriately modeled as a root quality goal.
- \textit{And-refinements} are n-ary relationships relating one parent to one or more children, each of the child describe a fine-grained sub-goal of its parent. The fulfillment of all the n children (with n \(\geq 2\)) makes the parent fulfilled. As shown in Fig.1, quality teaching, as the root goal, has been and-refined into sub-goals according to the aforementioned quality teaching framework presented.
- \textit{Tasks} represent actions that executed to fulfill specific goals. In this paper, we model MOOCs and traditional courses as two tasks that can be carried out to achieve quality teaching.
- \textit{Contributions} represent the effects of tasks on quality goals, and are essential to assist analysts in the decision-making process among alternative tasks. Thus, we here focus on analyzing how MOOCs and traditional courses contribute to the achievement of quality teaching, based on which we draw the conclusion about how MOOCs complement traditional courses.

Taking a closer look at Fig.1, we discuss how MOOCs and traditional courses contribute to various sub-goals of quality teaching.

- Firstly, when it comes to learning motivation, students who proactively enroll MOOCs normally have very well intrinsic motivation, i.e., learning new skills and improving themselves. On the other hand, there is no such guarantees in the traditional courses. Instead, students can obtain credits from traditional courses that are necessary for their graduation, contributing to promote their extrinsic motivation.
- Next, as students enroll in MOOCs are eager to learn new knowledge and skills, it is comparatively easier for teachers to determine the depth of course. Specifically, teachers are able to teach more advanced knowledge and skills as most students are intended to learn as much as possible in MOOCs. As for teachers in traditional courses, they have to take into account all levels of students who enroll the course, and make sure the courses are suitable for most of the students. It is worth noting that not all students have well intrinsic motivations in the traditional courses, and parts of them only want to pass the course to get the credits. Thus, such students might not be proactive enough to learn advanced knowledge and skills.
Moreover, traditional courses typically involve a systematic arrangement of courses, specifying and enforcing the prerequisites of each course. Especially, such arrangements are typically planned in a holistic viewpoint in the sense that the decision maker knows all courses well, including the depth of the course. Therefore, students can benefit from such an arrangement. In contrast, although MOOCs may also describe prerequisites of each course, there is a lack of enforcement of such prerequisites.

Furthermore, thanks to the various communication venues provided by MOOCs, e.g., instant message applications and online forums, students are able to interact with each other in a convenient manner. However, students are not easy to interact with teachers in MOOCs, and vice versa. As for traditional courses, teachers and students can directly communicate via different channels, such as question and eye contact.

Lastly, when taking MOOCs, students can have tests once they finish a small chunk of learning tasks, help them to get instant feedback on their learning results. And by the end of a course, all such tests compose comprehensive evaluation records, which can better demonstrate students’ actual academic performance.

Figure 1. A goal model of quality teaching.

Based on the above discussions, we here tentatively summarize the interrelationship between MOOCs and traditional courses. After we decompose the root goal of quality teaching into corresponding sub-goals with regard to the quality teach framework work, as shown in Fig.1, both of MOOCs and traditional courses play an indispensable role in achieving quality teaching. As a result, instead of making a choice between these two teaching paradigms, we should investigate an appropriate way to combine them in order to deliver both of their strengths. In other words, we argue that MOOCs should be able to complement traditional courses rather than being a replacement.
Conclusion

MOOCs were initially considered as a revolution for higher education, and we gradually understand that MOOCs has both positive and negative impacts based on the continuous investigations of MOOCs by scholars. Do MOOCs have the capability of replacing the traditional courses? What might be the relationship of MOOCs and traditional courses? In this study, we adopt goal modeling technique to compare MOOCs with traditional courses in terms of quality teaching in higher education. The results show MOOCs have some advantages to achieve quality teaching while traditional courses also have some that might not be achieved by MOOCs. Thus, we conclude MOOCs will be an essential supplement of traditional courses rather than a replacement for the goal of quality teaching in higher education.

Acknowledgement

This study was financially supported by Beijing Office for Educational Sciences Planning, and it is in the Youth Research Project Evaluating the Quality of MOOCs in the Era of Big Data (No. CCHA17146).

References


