

Use the AMP Tool to Characterize Pedagogical Approaches Taken by MOOC Courses in Mainland China

Yibo Fan
South China Normal University
yibofanscnu@163.com

The pedagogy of MOOC has always been a neglected area since the onset of MOOC movement. However, it does not mean that the MOOC pedagogy is less important than other topics. In this paper, the AMP tool is utilized to analyze five science courses and five art courses selected from one of the top MOOC platforms named XuetangX in order to characterize the pedagogical approaches taken by MOOC courses in mainland China. The analysis result shows that the current MOOC courses in mainland China are mere replication of traditional courses in digital format regardless of the type of the selected courses. Science courses are objectivist-oriented, teacher-centered and highly structured, unable to support cooperative learning and immediate feedback. While the art courses are slightly different with the science courses, which are constructivist-oriented and less structured and unable to support immediate feedback either. Neither the science courses nor the art courses take sophisticated pedagogical approaches that have been proven effective on learning. This research shall have some implications for both MOOC designers and providers.

Keywords: MOOC pedagogy; MOOC in mainland China; Pedagogical approaches

Introduction

It seems that MOOC has caused a perfect storm in the world of higher education since its first appearance in 2008(Cormier, 2008), and the New York Times even declared 2012 as “The Year of the MOOC”(Pappano, 2012). Since then, researchers around the world have done a lot in terms of MOOC research, for instance, the high attrition rate of MOOCs(Breslow et al., 2013; Jordan, 2014), the reason why learners drop out(Gillani & Eynon, 2014; Hew, 2015), the assessment and accreditation of learning in MOOCs(Breslow et al., 2013; Daniel, 2012; Meyer & Zhu, 2013), peer assessment in MOOCs(Kulkarni et al., 2013; Suen, 2014) etc.. However, there is one area that the researchers paid little attention to, which is the MOOC pedagogy(Bali, 2014; Bayne & Ross, 2014; Knox, 2014; Swan, Day, Bogle, & van Prooyen, 2014).

The large-scale development of MOOC in mainland China took place in 2013, with more and more journal papers on MOOCs get published and various MOOC platforms emerged. Meanwhile, many workshops, conferences and forums have been held to bring together educators, practitioners, researchers and administrators to discuss the prospect and vision of MOOC in mainland China. It is true of that MOOC has been a buzzword in the field of Educational Technology in mainland China. More and more institutions are investing to develop MOOC and because not all the MOOC courses are the same, it is important to distinguish them(Swan et al., 2014). And this should be the very first step in the “research, evaluation, and assessment of learning” in MOOCs just as Reeves and Hedberg argue.

Just as above mentioned, MOOC has attracted tremendous amount of attention from education, industry and government etc. And due to the importance of the MOOC pedagogy for both practitioners and learners and even educational reform, it is necessary for researchers to distinguish the different pedagogical approaches taken by various MOOC courses in mainland China. Therefore, in this paper, the author selected five STEM courses and five non-STEM courses from XuetangX, one of the excellent MOOC platforms in mainland China, and then utilize the AMP tool developed by Swan et al.(2014), to characterize the pedagogical approaches in order to generalize the characteristics of these specific courses.

MOOC Platforms in Mainland China

Currently, the popular MOOC platforms in mainland China include international platforms such as edX, Coursera and the local platforms Coursera Zone, Guokr MOOC Academy, XuetangX, CNMOOC, UOOC Alliance etc. However, because this paper is aimed to provide an overview of MOOC practice in mainland China, the introduction to edX and Coursera is not included.

XuetangX is established by Tsinghua University in October 2013 using edX open-source code repository. Currently, there are 403 courses available in this platform, most of them are STEM courses. Top universities both in mainland China and around the world provide courses in this platform.

Guokr MOOC Academy, the largest discussion forum for Chinese MOOC learners, is founded in October 2013. And before that, it was just a special interest group in the BBS of Guokr. In this platform, there are hundreds of thousands of learners sharing with each other their learning experiences every day, thus forming a magic learning community for Chinese MOOC learners. Learners in this platform can discuss with each other about the courses they are taking in Chinese. What is more, there are volunteers translating courses on foreign MOOC platforms into Chinese, which opens a door for those who have language barrier to access the top-class courses in the world.

In October 2013 Coursera announced that it will launch in partnership with the Chinese internet provider NetEase, Coursera Zone, a Chinese platform adjusted to Chinese students' needs. One advantage of Courera Zone in contrast to Coursera is that the language of it is Chinese. Furthermore, the employment of CDN technology can increase loading speed of Coursera videos.

Another major Chinese MOOC platform is CNMOOC, launched in April 2014. Currently, there are 25 ongoing courses in this platform, covering a wide range of discipline domain. In partnership with 32 Chinese universities, CNMOOC is planning to provide more courses to Chinese MOOC learners in the near future.

UOOC Alliance, founded in May 2014 with the joint efforts of 56 Chinese universities, aims to provide the best educational resources to Chinese MOOC learners, including those matriculated students and non-matriculated ones. Table 1 presents the prevalent MOOC platforms in mainland China.

Table 1

Prevalent MOOC Platforms in Mainland China

MOOC platform	Founded date
XuetangX	October 2013
Guokr MOOC Academy	October 2013
Coursera Zone	October 2013
CNMOOC	April 2014
UOOC Alliance	May 2014

In this paper, the courses we selected for analysis are from XuetangX for the following reasons. First, from Table 1 we can see that the XuetangX is one of the earliest founded MOOC platforms in mainland China. Second, XuetangX are built on the basis of the open-source code of edX and other platforms are locally designed. And more importantly, the courses on XuetangX are mainly provided by top universities in mainland China, therefore, the course quality is relatively high.

What Is AMP Tool?

The AMP tool is an instrument that characterizes the pedagogical approaches taken by individual MOOCs along ten dimensions, which are epistemology, role of teacher, focus of activities, structure, approach to content, feedback, cooperative learning, accommodation of individual differences, activities/assignments and user role, and the scale for each dimension is from one to five(Swan et al., 2014). It is based on a similar tool developed by Thomas Reeves for describing the pedagogical dimensions of computer-based instruction(Reeves, 1994). And Thomas wrote: pedagogical dimensions are concerned with those aspects of design and implementation that directly affect learning(Reeves, 1994).

Course Selection

In order to make sure that the courses selected for analysis are homogenous and diversified and representative, thus drawing a whole picture of pedagogical approaches taken by MOOC courses in mainland China. Therefore, in this study, the researcher selects five STEM courses and five non-STEM courses from XuetangX MOOC platform according to the number of enrolled participants. The ten courses are Algorithm of Big Data, Linear Algebra, Calculus, Introduction to Computer Network, Data Structure, Guide to English Writing, Introduction to

Psychology, Innovative Thinking and Professional Research, History of Chinese Architecture and Introduction to Zizhi Tongjian. The courses selected and number of enrolled learners of each course are shown in the Table 2.

Table 2
Courses Selected and Number of Enrolled Learners of Each Course

Courses(STEM & non-STEM)	Number of enrolled learners of each course
Algorithm of Big Data	5704
Linear Algebra	3896
Calculus	15000
Introduction to Computer Network	12000
Data Structure	6222
Guide to English Writing	7197
Introduction to Psychology	37000
Innovative Thinking and Professional Research	21867
History of Chinese Architecture	10529
Introduction to Zizhi Tongjian	30252

Methodology

Four reviewers independently reviewed the ten courses they were given, and then came together to see if they could reach consensus on their ratings. After two iterations, the reviewers came to an agreement on their ratings. And the MOOC review process and result are described in the following section.

Result

This section presents the analysis result of the five STEM (Science, Technology, Engineering, Mathematics) and five non-STEM courses selected.

Table 3 gives the average rating for the evaluated STEM courses from XuetangX, which shows that the STEM courses follows a format that resembles the traditional courses. These courses are objectivist, teacher-centered, convergent, highly structured, more abstract than concrete, the feedback is infrequent and unclear, ignorant of individual differences, the activities/assessment are more artificial than authentic.

Table 3
Average Ratings for STEM Courses on XuetangX

Dimensions of the AMP tool	Ratings for STEM courses on XuetangX
Epistemology	1.3
Role of teacher	1.3
Focus of activities	2.7
Structure	5.0
Approach to content	3.0
Feedback	1.3
Cooperative learning	1.3
Accommodation of individual differences	2.4
Activities/assessment	1.2
User role	3.2

Summary of pedagogical approaches of STEM courses: Most of the selected courses are just the replication of traditional college courses in a digital format. What we can learn from Table 4 is that the Selected STEM courses are very objectivist and teacher-centered. Meanwhile, most of the exercises have only one answer, the organization of different materials is very consistent, which means that the courses are perfectly structured. Due to the nature of the STEM courses, it is not likely to support cooperative learning and meet individual differences. And the participants are just accessing the learning materials and completing assignments, acting as the consumers of learning resources rather than the producers of knowledge. What is more, the courses do not support immediate feedback, no matter from the teachers or the peer learners.

Table 4

Description of Pedagogical Approaches Taken by STEM Courses

Note: Table 4 is the description of pedagogical approaches taken by STEM courses based on the average ratings shown in Table 2.

Pedagogical category		Ratings					
Epistemology	Objectivist	1	2	3	4	5	Constructive
Role of teacher	Teacher-centered	1	2	3	4	5	Student-centered
Focus of activities	Convergent	1	2	3	4	5	Divergent
Structure	Less-structured	1	2	3	4	5	More-structured
Approach to content	Concrete	1	2	3	4	5	Abstract
Feedback	Infrequent, unclear	1	2	3	4	5	Frequent, constructive
Cooperative learning	Unsupported	1	2	3	4	5	Integral
Accommodation of individual differences	Unsupported	1	2	3	4	5	Multifaceted
Activities/assessment	Artificial	1	2	3	4	5	Authentic
User role	Passive	1	2	3	4	5	generative

Table 5 gives the average rating for the evaluated non-STEM courses from XuetangX, which shows that the non-STEM courses follows a format that significantly different with the format taken by STEM courses as shown in Table 3 and Table 4. These courses are constructivist, neither teacher-centered nor student-centered, divergent, moderately structured, concrete, ignorant of individual differences, the activities/assessment are authentic. However, there is one interesting and strange phenomenon that, to some extent, even the non-STEM courses hold a similar design with the STEM courses. The non-STEM courses do not provide frequent and clear feedback either.

Table 5

Average Ratings for Non-STEM Courses on XuetangX

Dimensions of the AMP tool	Ratings for STEM courses on XuetangX
Epistemology	5.0
Role of teacher	3.0
Focus of activities	4.2
Structure	3.0
Approach to content	2.0
Feedback	1.0
Cooperative learning	3.0
Accommodation of individual differences	3.0
Activities/assessment	4.4
User role	4.5

According to the average ratings shown in Table 5, Table 6 presents the description of pedagogical approaches taken by non-STEM courses.

Table 6
Description of Pedagogical Approaches Taken by Non-STEM Courses

Pedagogical category		Ratings					
Epistemology	Objectivist	1	2	3	4	5	Constructivist
Role of teacher	Teacher-centered	1	2	3	4	5	Student-centered
Focus of activities	Convergent	1	2	3	4	5	Divergent
Structure	Less-structured	1	2	3	4	5	More-structured
Approach to content	Concrete	1	2	3	4	5	Abstract
Feedback	Infrequent, unclear	1	2	3	4	5	Frequent, constructive
Cooperative learning	Unsupported	1	2	3	4	5	Integral
Accommodation of individual differences	Unsupported	1	2	3	4	5	Multifaceted
Activities/assessment	Artificial	1	2	3	4	5	Authentic
User role	Passive	1	2	3	4	5	generative

Summary of pedagogical approaches of non-STEM courses: What is slightly different from the STEM courses is that the selected non-STEM courses are more constructivist instead of being objectivist. The learners are more positive to participate in the creation of knowledge. Compared to the STEM courses, the non-STEM courses are less structured. Teachers of these courses usually create nearly authentic environment to help foster cooperative learning, and individual differences are met. Identical with the STEM courses, the non-STEM courses do not support feedback very well.

In order to make the analysis result clearer, the author presents the pedagogical patterns in one single table, as shown in the following Table 7.

Table 7
Patterns in Pedagogical Approaches Found in the Selected Courses

Pedagogical category		Ratings					
Epistemology	Objectivist	1	2	3	4	5	Constructivist
Role of teacher	Teacher-centered	1	2	3	4	5	Student-centered
Focus of activities	Convergent	1	2	3	4	5	Divergent
Structure	Less-structured	1	2	3	4	5	More-structured
Approach to content	Concrete	1	2	3	4	5	Abstract
Feedback	Infrequent, unclear	1	2	3	4	5	Frequent, constructive
Cooperative learning	Unsupported	1	2	3	4	5	Integral
Accommodation of individual differences	Unsupported	1	2	3	4	5	Multifaceted
Activities/assessment	Artificial	1	2	3	4	5	Authentic
User role	Passive	1	2	3	4	5	generative

Conclusion and Future Direction

The comparison of STEM and non-STEM courses reveals that most of the courses we reviewed are merely the replication of traditional college courses in digital format, which can do no good for learners to develop their higher-order thinking skills. The future design of MOOCs should meet learners' needs and increase their retention rate, which presents a pedagogical and design challenge for MOOC researchers and providers around the world. And this research merely reveals the pedagogical approaches taken by STEM and non-STEM courses from one MOOC platform alone. Therefore, it may be not enough to fully reflect the whole picture of the pedagogical patterns of MOOC courses in mainland China. Hence, in order to get rid of the homogeneity of courses and platform selection, future research shall include more courses from various platforms to increase the validity and reliability of the analysis result. And it is true of that there exist popular courses and not-so-popular courses, therefore, it is meaningful for future research to consider the comparison between the two kinds of courses, thus exerting

implications for both MOOC course designers and researchers. And finally, it can provide some constructive advice and suggestions for the design and development of MOOC courses.

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