

# An Empirical Analysis of Chinese College Learners' Obstacles to MOOC Learning in an English Context

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Received: January 10, 2017 Accepted: February 13, 2017 Online Published: February 15, 2017

doi: 10.5539/elt.v10n3p

URL: <http://doi.org/10.5539/elt.v10n3p136>

## Abstract

This article reports a study applying an exploratory factor analysis to discovering the underlying factor structure of Chinese college students' obstacles to learning MOOC in an English context. Seven obstacle factors are identified: 1. academic and language skills; 2. internet skills; 3. course instruction/ management; 4. learning motivations; 5. social interaction; 6. cost of learning; 7. time and support. The four independent variables that significantly affect Chinese college learners' ratings of the obstacle factors are (a) learning enjoyment; (b) self-efficacy; (c) effectiveness of learning; (d) English proficiency level. The relationships among these independent variables and critical dependent variables are also explored.

**Keywords:** MOOC, obstacles to learning, exploratory factor analysis, Chinese college learners

## 1. Introduction

Massive Open Online Courses (MOOC) has evoked massive enthusiasm around the world. Some top-rated universities are making efforts to come up with ideas to utilize MOOC, hoping that this new mode of learning would be able to "revolutionize" and "democratize" the higher education. In China, some universities even modify their regulations to recognize and transfer credits earned through completion of some MOOC. The situation in China is a little bit more complicated. Since Chinese educators expect students to develop an international perspective, and to participate in global competition, MOOC lectured in English provide a reliable source of learning materials for Chinese college students. Here the term MOOC lectured in an English context (hereinafter referred to as MEC) refers to those MOOC that are totally made in English, not necessarily those English language courses, but any MOOC with specific subject content. For example, MOOC with subjects like marketing management, human resource management, finance, law, business management, etc.

Since English is a foreign language in China, many researchers may assume that MEC would be difficult to Chinese college students, which means the English language per se would constitute a big obstacle to those Chinese MOOC learners. Other factors, such as low learners' self-efficacy, poor self-regulation, and bad time-management skills might all contribute to their obstacles to learning this kind of MEC.

Learning MOOC differs from the pre-determined structure of conventional higher education. The absence of interaction between the instructor and learners on a MOOC requires individuals to self-regulate their own learning, determining when, how and with what content and activities they engage (DeBoer, Ho, Stump, Breslow, 2014).

However, due to the characteristics of MOOC (such as open access, learning at a distance and scale, lack of face-to-face instruction, informally structured learning space), its effects on learning is not yet widely recognized. To some educators' dismay, they observed high dropout rates (Carr, 2000), low motivation of students to learn (Maltby & Whittle, 2000) and low student satisfaction (Kenny, 2003) with the MOOC learning experience.

Certainly these situations are not true for all students under all circumstances. But educators have to admit that significant differences still exist in the way learners perceive their online experiences during MOOC learning. Learners' perceptions may contribute to the aforementioned negative outcomes like high dropout rates and low motivation to learn and lower student satisfaction with the online learning experiences. Hence the individual differences, especially their motivations, time management skills, self-regulation level etc., are still worth investigating.

Hence, this study explores in detail what factors constitute obstacles to Chinese college learners' MEC learning. The students are selected randomly in a famous Chinese university known for its specialties in foreign languages and foreign trade studies. The study is structured around the following research questions: 1. What obstacles Chinese students' have to face in MEC learning?; 2. How much does each obstacle correlate to independent variables, such as students' genders, grades, English proficiency levels?

## 2. Literature Review

MOOC offers open, online access to learning at a massive scale to any learners who find themselves interested in certain courses but not having the chance to learn on campus. These courses offer non-formal learning opportunities, where learners can choose their own way of engagement. A typical MOOC is often divided into several lecture videos, coupled with automated assessment system, an online learning forum where participants can interact with their peers (who also attend the same MOOC).

Ever since 2012, when MOOC emerged and quickly stepped onto the stage of higher education, MOOC learners were expected to be highly motivated and skilled learners who have the ability to choose their own resources and ways of learning. But the reality is quite different from educators' expectations. They found that actually many learners failed to complete the courses and found themselves lost in finding the appropriate learning modes. In other words, they meet some obstacles to their MOOC learning.

Previous studies have identified significant differences in terms of learning expectations, learning attitudes, self-efficacy, learning motivations. For example, Chen (1986), Teo and Lim (2000) found that gender may play a role in affecting learners' attitudes towards using computer technology to learning; age, is found by Rekkedal (1983) to be an important factor having effect on learners' attitudes and progress in the context of online learning; Koobang (1989), Hara (1998), Hara and Kling (1999) found that learners' ability and confidence with online learning technology, or so-called students' experiences with learning technologies can also affect their attitudes and effectiveness towards online learning; Mungania (2003) found that learners' self-efficacy—their perceptions that one can be successful learner online, affects their learning effectiveness in the online learning environment.

## 3. Methodology

The survey was a slightly modified version of a published, validated instrument designed to measure Chinese college students' obstacles to MEC learning. The instrument was revised at the minimum level to maintain the focus of the original, and to fit the specific situations of Chinese college learners studying MEC. The language is simplified, rephrased and translated into Chinese to facilitate the understanding of the subjects. Items were reviewed to assess their suitability for use within the MEC context. The researcher collected data through internet questionnaire sites, by sending the questionnaire link to selected groups of students, which were picked randomly. After data collection, the researcher classified the data according to several criteria, such as gender as an independent variable, English proficiency level as well.

The questionnaire was designed by adopting the framework of Muilenburg's study, with moderate modifications to suit the situation of Chinese college students. Items were reviewed to assure their suitability for use within the context of MEC learning.

The instrument is structured into two parts. The first part uses several questions to help students identify themselves. Independent variable items include gender, grade, English proficiency level, students' perceptions of learning effectiveness and self-efficacy level concerning this type of learning, and the number of MEC completed and dropped. This part is meant to help the researcher classify the students into different groups to investigate whether there are significant differences among different groups of students.

In the second section, the researcher included 50 items, selected on the basis of their relevance to this type of learning. Different from Muilenburg's version, the researcher assumed there were mainly seven factors, by grouping some items into broader and more sensible factor groups. The assumable factors include Learning Motivation, Course instruction/administration, Academic and Language Skills, Social Interaction, Time and Support, Cost and Access to the Internet, Internet Skills. The surveyed were asked to rate these items according to their perceptions from personal experience or prediction on the basis of personal imagination of their future learning (self-efficacy). They were required to rate each of the 50 obstacles on a 1-5 Likert scale.

The instruction part explains very clearly that the number 1 refers to "no obstacle", 2 means "little obstacle", 3 means "moderate obstacle", 4 means "serious obstacle" and 5 means "very serious obstacle". By choosing 5 means the student thinks that he/she meets a very serious obstacle which is very hard to overcome in the process of learning or in his/her prediction of future learning. By choosing 4, 3, 2 refers to the situation when the student perceives or predicts different levels of obstacle. Number 1 "no obstacle" indicates that the student does not meet

or predict difficulty in the learning.

#### 4. Findings

Data were collected from July to October, 2016. Survey responses with large blocks of missing data were omitted. Survey responses that had the same rating for every item were considered to be completed with little mindfulness and therefore omitted as well. Finally the number of valid survey responses is 516.

Among them, 27.9% (n=144) are male, 72.1% (n=372) are female. About half of them are the junior (third year) students (n=253, 49%), freshman (first year) and senior (fourth year) students equal in number (n=80, 15.5%), sophomore (second year) students account for 20% (n=103) of the total surveyed.

As for English proficiency level, about half of the respondents (n=256, 49.6%) passed the College English Test Band 6 (CET 6), a quarter of them passed CET 4 (n=129, 25%), and 18 percent of them (n=93) have not passed any English language proficiency tests.

As for their perceptions or predictions of MOOC learning, a striking balance is reached in terms of items such as “I have never learned MEC, and I have no confidence in learning it well” and “I have never learned MEC, but I have confidence that I can learn it well in the future”. Each of these two items reached 43% of the total. And this category of items actually represents learners’ self-efficacy. The item “I have learned MEC, and I feel good about the process and result of the learning” has scored 5% (n=26). The item “I am learning MEC, but I am not sure whether I can learn it well” got 3.3% (n=17). Only 2.7% (n=14) of them choose the item “I am learning MEC, and I feel good about it and have a lot of confidence in it”. Similarly, 2.1% (n=11) of them choose “I have learned MEC, but I don’t feel good about the process nor the result of it”.

A majority of the respondents (68.8%, n=155) have not taken any MEC, and among them, 20.4% (n=105) predict that the effectiveness of MOOC learning would be worse than classroom learning, 27.1% (n=140) predict no significant difference, and 21.3% (n=110) predict that the effectiveness of the former would be better than the latter one. It is found that 32.7% of them (n=161) are learning or have learned MEC. Among them, 11.8% (n=61) think that the effectiveness of MEC learning is worse than that of classroom learning. 8.9% of them (n=46) find no difference in both types of learning, while 10.5% (n=54) think that MEC learning is better than classroom learning.

The percentage of those who have taken MEC think that the enjoyment brought about by MEC learning is greater than that of classroom learning is merely 7.2 % (n=37), and the number of those who find no difference in both types of learning and that the enjoyment felt in MEC learning is lower than that of classroom learning coincide at 53 (10.3%). Among those who haven’t taken any MEC, 27.9% (n=144) of them predict that the enjoyment brought about by MEC would exceed that of classroom learning, while 25.4% (n=131) predict no difference, and 19% predict that the former would be worse than the latter.

#### 5. Analysis of the Result

In order to determine that the scale was suitable for an Exploratory Factor Analysis, the researcher conducted a reliability test and found the Cronbach’s Alpha of the whole scale was 0.968, indicating a very good internal consistency within the instrument (see Table 1).

Table 1. Reliability statistics

Cronbach’s Alpha	N of Items
.968	50

Analysis of the items was conducted on 50 items hypothesized to assess students’ perceptions of obstacles to MEC learning. Each of the items was correlated with the total score, with the item removed. The score of Cronbach’s Alpha if Item Deleted were all greater than 0.96. Therefore, all 50 items were retained for in the scale. By using the KMO and Bartlett’s Test, the researcher found that the MSA (Measure of Sampling Adequacy) value of the entire matrix was 0.959, a score well above the 0.90 marvelous level. The greater the KMO (close to 1), the more commonalities among those variables, and the lower correlation coefficients among them (Kaiser, H.F. and Rice, J. 1974). This further indicates that the whole scale is suitable for a factor analysis. (see Table 2).

Table 2. KMO

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.959
Bartlett's Test of Sphericity	Approx. Chi-Square	17476.147
	df	1225
	Sig.	.000

In order to determine the structure underlying the data collected, the researcher used the Principal Component Analysis (PCA) with Varimax rotation. Seven factors were extracted as previously expected using latent root (eigenvalue) criterion, which is commonly believed to be the most effective technique for factor extraction. The PCA of the 50 items resulted in seven factors. As is shown in the following Table 3, the Initial Eigenvalues of the seven factors are all greater than 1, which suggests that they should be considered as significant. The table also shows the percentage of variance accounted for by each of the factors. Put together, the seven factors account for 62.352% of the overall variance. This suggests the structure of the scale is reasonable, and the seven factors are already able to explain most of the total variance.

Table 3. Total variance explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	19.726	39.452	39.452	6.700	13.401	13.401
2	3.404	6.809	46.260	6.053	12.106	25.507
3	2.129	4.258	50.518	4.657	9.313	34.820
4	1.709	3.418	53.936	4.136	8.273	43.093
5	1.538	3.075	57.011	4.119	8.239	51.331
6	1.456	2.913	59.924	2.819	5.639	56.970
7	1.214	2.428	62.352	2.691	5.382	62.352

Extraction Method: Principal Component Analysis.

Table 4 shows the variables (the variables are represented by the letter v plus a number to indicate their relative positions in the scale, which is a preset rule in SPSS software) loading on each of the components. Presumably the researcher reckoned that there existed seven factors: 1) lack of learning motivation; 2) lack of course instruction/administration; 3) lack of academic and language skills; 4) lack of social interaction; 5) lack of time and support; 6) cost of course and internet access; 7) lack of internet skills. In processing the data, the researcher adopted a cutoff for statistical significance of the factor loadings of 0.50, because loadings of 0.50 or greater are considered partially significant (Hair et al., 1998).

But according to the data structure revealed in the rotated component matrix, the sequence and composition of the seven factors seem to be different from the researcher's assumption. Therefore the researcher attempted to rename these factors accordingly. The following list shows the renamed factors:

Factor 1: Academic and Language Skills;

Factor 2: Internet Skills;

Factor 3: Course Instruction/Management;

Factor 4: Learning Motivations;

Factor 5: Social Interaction

Factor 6: Cost of Learning

Factor 7: Time and Support

As is shown in Table 4, each item loaded distinctively on one factor. But six of the 50 items were deleted simply because their factor loadings were below the selected 0.50 cutoff rate. These items include: a) the adaptation to

the change of learning styles brought about by MEC; b) the feeling of loneliness and helplessness brought about by MEC learning; c) I prefer discussing with co-learners offline; d) poor time management skills; e) no fees required by MEC learning leads to lack of motivation; f) lack of time to study.

Table 4. Rotated component matrix<sup>a</sup>

	Component						
	1	2	3	4	5	6	7
V21	.771						
V22	.771						
V20	.732						
V23	.727						
V19	.719						
V17	.717						
V18	.715						
V24	.591						
V49		.797					
V45		.797					
V46		.794					
V48		.753					
V50		.733					
V47		.731					
V43		.599					
V39		.505					
V11			.688				
V16			.663				
V12			.642				
V13			.604				
V8			.588				
V10			.575				
V15			.564				
V9			.543				
V3				.696			
V5				.682			
V4				.672			
V2				.574			
V7				.565			
V1				.542			
V6				.524			
V29					.671		
V31					.632		
V32					.567		
V28					.565		

V27	.557		
V30	.521		
V40		.638	
V44		.618	
V42		.605	
V35			.678
V37			.589
V38			.556
V34			.518

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization. Cutoff=0.50

<sup>a</sup>. Rotation converged in 8 iterations.

### 5.1 Overall Severity of Learning Obstacles

After identifying the seven factors by way of rotated component matrix, the researcher calculated the factor scores for each of the seven factors. The means of the seven factors were used to rank the obstacles from the most severe to the least (see Table 5). As a 5-point Likert scale is used, the researcher holds that factor (or item) means greater than 2.5 can be regarded as having a significant negative effect on MEC.

According to this criterion, the most severe obstacle to learning is Factor 1: Academic and Language Skills (M=2.925), the least severe obstacle is Factor 2: Internet Skills (M=2.41). The ranking of all the seven factors, from the most severe to the least, can be found in the following list:

- 1st. Factor 1: Academic and Language Skills (M=2.925);
- 2nd. Factor 3: Course Instruction/ Management (M=2.803);
- 3rd. Factor 4: Learning Motivations (M=2.75);
- 3rd. Factor 6: Cost of Learning (M=2.75) ;
- 5th. Factor 5: Social Interaction (M=2.67);
- 6th. Factor 7: Time and Support (M=2.57);
- 7th. Factor 2: Internet Skills (M=2.41).

Within the subgroup of each factor, the scores of different items can vary from very high to very low. These differences also indicate learners' perceptions of the obstacle's severity to MEC learning in terms of specific items.

### 5.2 Differences among Subgroups

To determine whether particular subgroups of respondents viewed obstacles differently, the researcher conducted a series of ANOVAs using factor scores for the obstacles as dependent variables. Five independent variables tested were found to affect learners' ratings of obstacles to MEC learning significantly (in statistical sense,  $p < 0.05$ ). They are, namely, gender, English proficiency level, learning enjoyment, learner's self-efficacy, learning effectiveness.

In order to determine the strength of association of the independent variables to each of the seven obstacles factors, eta squared ( $\eta^2$ ) value was calculated for each ANOVA. Eta-squared is a measure of effect size for use in ANOVA. Eta squared value indicates the proportion of variance in the dependent variable that is explained by the independent variables.

A summary of the eta squared values for the significant ANOVA tests can be found in the following Table 5.

Table 5. Strength of association: Eta squared values for ANOVAs

Independent variables	Obstacle factors (listed in terms of perceived priority )				
	<i>Ac &amp; lang skills</i>	<i>Course instruction</i>	<i>Learning motivation</i>	<i>Cost of learning</i>	<i>Social interaction</i>
<i>Gender</i>	.006	.003	.000	.008	.000
<i>English proficiency level</i>	<b>.153</b>	.019	<b>.129</b>	.016	<b>.112</b>
<i>Enjoyment</i>	.030	<b>.070</b>	<b>.101</b>	<b>.046</b>	<b>.062</b>
<i>Learner's Self-efficacy</i>	<b>.079</b>	.029	<b>.081</b>	.015	.054
<i>Effectiveness</i>	.035	<b>.048</b>	<b>.080</b>	.039	.034

Conventionally, the eta squared values of .01, .06 and .14 are respectively interpreted as small, medium, and large effect sizes (Cohen J., 1988). As is shown in the table, the independent variable gender has very small effect size in relation to the five factors (much lower than .01). Therefore, it can be interpreted that gender does not exercise much influence on the learners' perceptions of learning obstacles. Hence, gender is not chosen as a critical independent variable in the following discussion.

## 6. Discussion

According to the effect size shown in Table 5, four important independent variables are chosen for further discussion. They are listed in terms of effect size: 1) English proficiency level; 2) learning enjoyment; 3) self-efficacy; 4) effectiveness of learning. Within this data set, several significant relationships between these important independent variables and the five most critical obstacles identified previously in this paper need to be explored further. The five most critical obstacles (factors) are: a) academic and language skills; b) course instruction/management; c) learning motivations; d) cost of learning; e) social interaction.

### 6.1 English Proficiency Level

Considering that the current study is carried out in the context of MEC learning, and the respondents are Chinese college students with English as a foreign language, it is assumed that English proficiency level would be a quite decisive independent variable. As is shown in Table 6, the learners who reported not passing any English test (N=129) are found to be encountering great trouble in academic and language skills (M=3.07, SD=0.94). As learners reached higher English proficiency levels, the means for the dependent variable academic and language skills decrease.

This phenomenon meet the researcher's expectation: as learners' English proficiency level increases, the scores of obstacle concerning language skills will decrease. However, the largest group of learners are those with a College English Test Band 4 certificate (N=256), and their ratings for these obstacles are still high (very close to 3). This might indicate that a CET4 certificate did not help learners alleviate their learning obstacles nor grant them with great confidence in learning MEC. Though learners with TEM8 certificate reported the smallest scores in all five obstacles, the number of this group is particularly small (N=5). Therefore this group's situation cannot represent the holistic situation. Nevertheless, improving English proficiency level is still regarded as being helpful to the alleviation of learning obstacles.

The strongest association found is between English proficiency level and the dependent variable academic and language skills ( $\eta^2 = 0.153$ ). Other two dependent variables, learning motivation ( $\eta^2=0.129$ ) and social interaction ( $\eta^2 = 0.112$ ), also have strong association with English proficiency level.

Table 6. Obstacle means by English proficiency level

English Proficiency Level		Ac & Lang Skills	Course Instruction	Learning Motivation	Cost of Learning	Social Interaction
1. <i>I haven't passed any English level test.</i>	Mean	<b>3.07</b>	<b>2.96</b>	<b>2.86</b>	<b>2.08</b>	<b>2.74</b>
	N	129	129	129	129	129
	SD	0.94	0.84	0.87	0.88	0.84
2. <i>I have passed College English Test Band 4 (CET4).</i>	Mean	<b>2.92</b>	<b>2.91</b>	<b>2.78</b>	<b>2.92</b>	<b>2.69</b>
	N	256	256	256	256	256
	SD	0.86	0.78	0.75	0.97	0.78
3. <i>I have passed College English Test Band 6 (CET6).</i>	Mean	<b>2.19</b>	<b>2.64</b>	<b>2.46</b>	<b>2.79</b>	<b>2.35</b>
	N	35	35	35	35	35
	SD	0.87	0.82	0.76	1.14	0.76
4. <i>I have passed Test for English Majors Band 4 (TEM4).</i>	Mean	<b>2.04</b>	<b>2.33</b>	<b>1.81</b>	<b>1.88</b>	<b>2.88</b>
	N	93	93	93	93	93
	SD	0.92	0.43	0.96	0.76	1.39
5. <i>I have passed Test for English Majors Band 8 (TEM8).</i>	Mean	<b>2.01</b>	<b>2.65</b>	<b>2.57</b>	<b>2.96</b>	<b>2.66</b>
	N	5	5	5	5	5
	SD	1.06	1.00	0.91	1.05	0.92

## 6.2 Learning Enjoyment

The learners were asked to compare how much they enjoyed learning MEC with learning in classroom. If they had not yet taken an MEC, then they were asked to predict how well they would enjoy learning MEC. According to the data presented in Table 7, learners who felt less enjoyment in MEC learning perceived significantly more obstacles in all the five factors as one might expect. But it is quite interesting that these learners have the highest score in the obstacle "Cost of learning" (M=3.32, SD=1.06). Presumably these learners cared quite more about the cost of MEC learning.

Those learners with the highest level of enjoyment while learning MEC perceived much less obstacles, and scored the less in five obstacles. The learners who predicted that they might enjoy MEC learning far less had significantly higher obstacle ratings, ranging from 3.08-2.89. But those who predicted far less enjoyment rated higher obstacles.

Table 7. Obstacle means by learning enjoyment

Learning Enjoyment		Ac & Lang Skills	Course Instruction	Learning Motivation	Cost of Learning	Social Interaction
1. <i>The sense of enjoyment brought about by MOOC learning is far less than classroom learning.</i>	Mean	<b>3.09</b>	<b>3.23</b>	<b>3.28</b>	<b>3.32</b>	<b>3.01</b>
	N	53	53	53	53	53
	SD	0.96	0.92	0.85	1.06	0.91
2. <i>The sense of enjoyment brought about by MOOC learning is the same as classroom learning.</i>	Mean	<b>2.73</b>	<b>2.49</b>	<b>2.47</b>	<b>2.78</b>	<b>2.41</b>
	N	54	54	54	54	54
	SD	1.01	0.81	0.89	1.07	0.88
3. <i>The sense of enjoyment brought about by MOOC learning is far more than classroom learning.</i>	Mean	<b>2.51</b>	<b>2.47</b>	<b>2.33</b>	<b>2.50</b>	<b>2.28</b>
	N	37	37	37	37	37
	SD	1.05	0.83	0.68	0.93	0.66
4. <i>I predict that the sense of enjoyment brought about by MOOC learning will</i>	Mean	<b>3.08</b>	<b>2.99</b>	<b>2.96</b>	<b>3.18</b>	<b>2.89</b>
	N	98	98	98	98	98

<i>be far less than classroom learning.</i>	SD	0.88	0.84	0.80	0.90	0.82
5. <i>I predict that the sense of enjoyment brought about by MOOC learning will be the same as classroom learning.</i>	Mean	<b>3.05</b>	<b>2.87</b>	<b>2.78</b>	<b>3.06</b>	<b>2.73</b>
	N	131	131	131	131	131
	SD	0.92	0.73	0.70	0.89	0.71
6. <i>I predict that the sense of enjoyment brought about by MOOC learning will be far more than classroom learning.</i>	Mean	<b>2.79</b>	<b>2.66</b>	<b>2.55</b>	<b>2.89</b>	<b>2.56</b>
	N	145	145	145	145	145
	SD	0.91	0.84	0.80	0.99	0.85

For those learners who felt the same level of enjoyment and those who predicted the same level of enjoyment, their ratings for all these obstacles are fairly moderate.

The strongest level of association, according to eta squared values, is between learning enjoyment and learning motivation ( $\eta^2=0.101$ ). Learning enjoyment has a medium effect with course instruction ( $\eta^2=0.070$ ) and social interaction ( $\eta^2=0.062$ ). Academic and language skills ( $\eta^2=0.030$ ), cost of learning ( $\eta^2=0.046$ ) constitute a weak relationship.

### 6.3 Self-efficacy

Self-efficacy is the extent or strength of one's belief in one's own ability to complete tasks and reach goals. In the domain of education, self-efficacy refers to a learner's confidence in accomplishing tasks and achieving goals. In this research, learners were asked to rate their level of confidence in MEC learning if they were already taking the courses. If they did not take any MEC courses, they were asked to predict the level of confidence.

As is shown in the Table 8, for those who had not taken any MEC courses (N=223) and had rated low level self-efficacy, they had the highest ratings across all the five obstacles. The highest is the obstacle learning motivation (M= 3.36, SD=0.81), which suggests that this large group of learners had problems in learning motivations. Some might have weak motivations to take any MEC courses. They also worried quite a lot about academic and language skills (M=3.18, SD=0.91), course instruction (M=3.16, SD=0.83) and social interaction (M=3.13, SD=3.04). For those who had not taken any MEC courses (N=226) but predicted strong confidence, their rating of obstacles are much lower. The learners taking MOOC courses with good confidence responded with low scores in obstacles.

Table 8. Obstacle means by self-efficacy

Self-efficacy		Ac & Lang Skills	Course Instruction	Learning Motivation	Cost of Learning	Social Interaction
1. <i>I have not learned MOOC in English and I lack confidence in it.</i>	Mean	<b>3.18</b>	<b>3.16</b>	<b>3.36</b>	<b>3.04</b>	<b>3.13</b>
	N	223	223	223	223	223
	SD	0.91	0.83	0.81	0.93	0.83
2. <i>I have not learned MOOC in English but I have full confidence in it.</i>	Mean	<b>2.70</b>	<b>2.74</b>	<b>2.57</b>	<b>2.46</b>	<b>2.57</b>
	N	226	226	226	226	226
	SD	0.91	0.82	0.78	0.97	0.79
3. <i>I am learning MOOC in English and I feel good and have confidence in it.</i>	Mean	<b>2.29</b>	<b>2.78</b>	<b>2.89</b>	<b>2.23</b>	<b>2.80</b>
	N	17	17	17	17	17
	SD	0.77	0.79	0.82	0.95	0.75
4. <i>I am learning MOOC in English but I lack confidence in it.</i>	Mean	<b>3.27</b>	<b>2.11</b>	<b>2.03</b>	<b>2.40</b>	<b>3.13</b>
	N	14	14	14	14	14
	SD	1.05	1.01	0.55	1.13	0.75
5. <i>I have learned MOOC in English and I feel good about the process and result of it.</i>	Mean	<b>2.61</b>	<b>2.81</b>	<b>2.52</b>	<b>2.92</b>	<b>2.42</b>
	N	38	38	38	38	38
	SD	1.00	0.98	0.75	1.25	0.85

The association was moderate between independent variable learners' self-efficacy and dependent variables academic and language skills ( $\eta^2=0.079$ ), and learning motivation ( $\eta^2=0.081$ ). Association with the other three independent variables are weak.

#### 6.4 Effectiveness of Learning

In this section, learners who had taken MEC courses were asked to compare its effectiveness of learning and that of classroom learning. If the learners had not taken any MEC, they were asked to predict and compare the effectiveness of both types of learning. In Table 8, those who predicted less effectiveness in MEC learning got the highest obstacle ratings across the spectrum of dependent variables. Those who found no difference (N=46) in terms of effectiveness of both types of learning and who predicted greater effectiveness (N=110) in MEC learning rated much lower level of obstacles. For those who found greater effectiveness of MEC learning (N=56), the ratings of the five obstacles are the lowest (Mean=2.68, 2.50, 2.42, 2.70, 2.41 respectively). According to this pattern, learners with more positive predictions and experience were found to be scoring less in obstacles, and those with more negative predictions and experience would find more troubles in MEC learning.

The strongest association is between effectiveness of learning and the obstacle learning motivation ( $\eta^2=0.080$ ). The association with other four obstacles are not very strong ( $\eta^2=0.035, 0.048, 0.039, 0.034$  respectively).

Table 9. Obstacle means by effectiveness of learning

Effectiveness of Learning		Ac & Lang Skills	Course Instruction	Learning Motivation	Cost of Learning	Social Interaction
1. I think MOOC learning is <b>less</b> effective than classroom learning.	Mean	<b>2.95</b>	<b>3.00</b>	<b>3.05</b>	<b>3.14</b>	<b>2.86</b>
	N	61	61	61	61	61
	SD	0.99	0.99	0.94	1.08	0.94
2. I find <b>no difference</b> between MOOC learning and classroom learning in terms of effectiveness.	Mean	<b>2.76</b>	<b>2.56</b>	<b>2.54</b>	<b>2.78</b>	<b>2.63</b>
	N	46	46	46	46	46
	SD	0.93	0.72	0.85	0.91	0.82
3. I think MOOC learning is <b>more</b> effective than classroom learning.	Mean	<b>2.68</b>	<b>2.50</b>	<b>2.42</b>	<b>2.70</b>	<b>2.41</b>
	N	56	56	56	56	56
	SD	0.98	0.88	0.69	1.05	0.80
4. I predict that my MOOC learning will be <b>less</b> effective than classroom learning.	Mean	<b>3.17</b>	<b>3.04</b>	<b>3.03</b>	<b>3.24</b>	<b>2.81</b>
	N	105	105	105	105	105
	SD	0.85	0.75	0.76	0.91	0.80
5. I predict that my MOOC learning will be <b>equally effective</b> as classroom learning.	Mean	<b>3.02</b>	<b>2.84</b>	<b>2.75</b>	<b>3.08</b>	<b>2.75</b>
	N	140	140	140	140	140
	SD	0.92	0.82	0.75	0.88	0.76
6. I predict that my MOOC learning will be <b>more effective</b> than classroom learning.	Mean	<b>2.72</b>	<b>2.67</b>	<b>2.51</b>	<b>2.81</b>	<b>2.50</b>
	N	110	110	110	110	110
	SD	0.98	0.84	0.81	1.02	0.84

## 7. Conclusion

This research selected obstacles to MEC learning as dependent variables in the research design. This arrangement would be able to help the interpretation and understanding of the major findings. In this study, the lack of academic and language skills is the most severe obstacle perceived by learners. At the same time, this factor has the strongest association with the independent variable English proficiency level, which indicates that for most Chinese college learners, English language proficiency and skills constitute the biggest obstacle to the learning of MEC. Therefore, the key to the promotion of MEC may lie in the improvement of the learner's English proficiency and language skills. The other possible solution might be the provision of Chinese subtitles

to help alleviate the language obstacle.

The obstacle course instruction/management is rated as the second biggest obstacle to learning. It has a strong association with the independent variable learning enjoyment. This may suggest that Chinese learners need more careful course instructions when they study online in order to improve the level of learning enjoyment.

The obstacle learning motivation is rated as the third biggest obstacle to learning. This obstacle has strong association with two independent variables: English proficiency level and learning enjoyment. This phenomenon reveals a fact that learners with low English proficiency and enjoyment would find themselves less motivated to take these online courses.

These discoveries will be quite meaningful to both MEC teachers and developers. If they want to attract more Chinese college learners to subscribe their online courses and improve the learning experience and effectiveness, they are recommended to probe into these obstacles. These factors should be always at the heart of educators' pedagogical considerations.

### Acknowledgement

This study is supported by Innovative School Project in Higher Education of Guangdong, China, GWTP-BS-2014-14. Supported by MOE Research Center for Online Education, China (QTONE EDUCATIOM), Grant No. 2016YB154.

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## Appendix

### Survey of Chinese College Students Learning MOOC in an English Context

Dear students,

We are a research team from *Guangdong University of Foreign Studies*. Thank you for sparing your precious time to complete this questionnaire!

It will take you approximately five minutes to complete the whole questionnaire, which contains only multiple choice questions.

Please make your choice according to your real situation. Your will contribute significantly to the scientific soundness of the research results.

We intend to better understand the situation of Chinese college students leaning *MOOC in an English context* (hereinafter referred to as *MEC*) through your responses to the questionnaire. We plan to conduct analysis on the basis of your responses and make relevant suggestions on how to improve the situation.

Before starting, please refer to the following definitions of relevant terms: 1). MOOC refers to Massive Open Online Courses; 2). *MOOC in an English context* refers to MOOC made and lectured all in English.

Thank you very much for your participation.

#### Part 1:

1) My gender is:

- Male
- Female

2) I am currently a:

- Freshman
- Sophomore
- Junior
- Senior

3) My English proficiency level:

- I have not passed any English proficiency test
- I have passed College English Test Band 4
- I have passed College English Test Band 6
- I have passed Test for English Majors Band 4
- I have passed Test for English Majors Band 8

4) I think the following description fits my situation:

- I have not undertaken any MEC, and I lack confidence on learning it
- I have not undertaken any MEC, but I have confidence on learning it in the future;
- I am learning an MEC, and I have confidence on it and feel good about it.
- I am learning an MEC, but I lack confidence on it.
- I have learned MEC and I feel good about the learning process and result.

5) I think the following description fits my situation:

(NB: *Classroom Learning* refers to learning in traditional classroom with peer students and teacher's instruction, hereinafter as *CL*)

- I think my MEC learning is worse than CL in terms of effectiveness.
- I think my MEC learning is similar with CL in terms of effectiveness.
- I think my MEC learning is better than CL in terms of effectiveness.
- I have not taken an MEC, and I predict my MEC learning will be worse than CL in terms of effectiveness.
- I have not taken an MEC, and I predict my MEC learning will be similar with CL in terms of effectiveness.
- I have not taken an MEC, and I predict my MEC learning will be better than CL in terms of effectiveness.

6) I think the following description fits my situation:

- MEC learning brings me far less enjoyment than CL does.
- MEC learning brings me similar level of enjoyment as CL does.
- MEC learning brings me far greater enjoyment than CL does.
- I have not taken an MEC, but I predict the enjoyment it brings will be far less than what CL does.
- I have not taken an MEC, but I predict the enjoyment it brings will be similar with what CL does.
- I have not taken an MEC, but I predict the enjoyment it brings will be far greater than what CL does.

7) I have completed (how many) \_\_\_\_\_ MECs.

(NB: Do not count the MEC that you are currently undertaking. )

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8 or more.

8) I quit (how many) \_\_\_\_\_ MECs.

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8 or more.

**Part 2:****The following section investigates the obstacles to MEC learning:**

Please rate the following obstacles according to your past MEC learning experience, or your prediction of your future MEC learning (no matter you have or have no plan to take an MEC).

You can rate the obstacles within a five-point scale. Number 1 means *no obstacle*, number 2 means *little obstacle*, number 3 means *moderate obstacle*, number 4 means *serious obstacle*, number 5 means *very serious obstacle*.

By choosing number 5 means you encounter an *insurmountable* obstacle when you undertake an MEC; or you predict that you will encounter an *insurmountable* obstacle when you undertake an MEC in the future.

By choosing numbers 4 to 2 means you encounter obstacles when you undertake an MEC, or you predict that you will encounter obstacles when you undertake an MEC in the future. You rate the obstacles according to their level of difficulty.

By choosing number 1 means that you *do not* encounter any obstacle, or you predict *no* obstacle in you future learning of the MEC.

**I. Learning motivations**

1. I find/fear that undertaking an MEC make/will make it difficult for me to manage time.
2. I find/fear that undertaking an MEC challenges/will challenge my learning capabilities.
3. I find/fear that I am not persistent enough to complete an MEC.
4. I find/fear that MEC learning environment does not arouse my interest to learn.
5. I am a procrastinator, it is difficult for me to finish the tasks required by an MEC on time.
6. I find/fear that MEC is too difficult to learn, and I intend to undertake an easier MOOC.
7. I find/fear that learning an MEC demands more personal responsibilities.
8. I find/fear that other schools or institutions do not recognize such MEC certificates of completion, therefore I do not want to undertake it.

**II. Course Instruction/Management**

9. I find /fear that the future of MEC learning is uncertain.
10. I find /fear that some teachers are not sure about how to instruct online.
11. I find /fear that it is difficult to consult instructors or experts online when there is a problem.
12. I find /fear that MEC learning materials are poorly compiled.
13. I find /fear that the size of MEC class is too big to fit an online study.
14. I prefer to discuss with my classmates offline.
15. I find /fear that MEC course materials such as textbooks cannot be sent to me on time.
16. I find /fear that MEC lacks support service, such as academic instruction or technical support.

**III. Academic and Language Skills**

17. I find /fear that I cannot understand the verbal instruction of an MEC.
18. I find /fear that I cannot understand the video instruction of an MEC.
19. I find /fear that I do not posses the knowledge required by an MEC.
20. I find /fear that I cannot use the proper English required by an MEC to finish the written homework.
21. I find /fear that I cannot communicate with the course instructor by using English.
22. I find /fear that I cannot use the proper English required by an MEC to finish a tape-recorded oral task.
23. I find /fear that I cannot use English to discuss with online learning partners and collaborate on our homework.
24. I find /fear that I cannot handle massive information obtained from the internet about the MEC.

**IV. Social Interaction**

25. I find /fear that MEC learning is lonely and helpless.

26. I find /fear that I find it difficult to adapt to the changes in learning styles required by MEC learning.
27. I prefer studying alone to online learning in cooperation with others.
28. I find /fear that it is very difficult to interact and cooperate online in an MEC learning.
29. I find /fear that I feel uneasy facing a cold and unfeeling screen when I undertake an MEC.
30. I find /fear that I cannot communicate with course instructor or administrator real-time when I undertake an MEC.
31. I find /fear that I lack learning motivation due to the lack of teacher's recognition and encouragement.
32. I do not know how to communicate with people online without the support of facial expressions and body language.

#### **V. Time and Support**

33. I want to learn an MEC well, but I have to give it up due to large amount of homework required by it.
34. My classmates do not support my MEC learning, since they think it is a waste of time.
35. My family does not support my MEC learning.
36. I want to learn MEC, but I am poor at time management.
37. I want to learn MEC, but the schedule of it conflicts with my school study, therefore I have to give it up.
38. I want to learn MEC but fail due to pressure from my school study.

#### **VI. Fees and Internet Access**

39. I think it is too costly to study online, therefore I do not want to undertake MEC.
40. It is hard to open some foreign MEC sites, which renders MEC learning a difficult matter for me.
41. I am not motivated to complete an MEC since it is for free.
42. I do not want to register for an MEC due to the fact that I need to pay for the certificate.
43. I have to spend a lot to upgrade my computer in order to undertake MEC, so I give up.
44. Learning MEC from foreign site requires me to pay for some software, so I give up.

#### **VII. The Use of Internet Skills**

45. I lack confidence in the use of computer and internet.
46. I find/fear that I do not possess the software skills required by MEC learning.
47. I fear that using computer and internet will threaten personal information safety.
48. I find/fear that I lack the skills to use the interactive system embedded in MEC learning.
49. I want to undertake MEC learning but worry about using new instruments for online learning.
50. I find/fear that I lack necessary skills for online searching, which will make it difficult for me to search for materials required by MEC learning.

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