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*Research Article*

## The Influence of Teachers' Answers on MOOC Community Discussion and Teaching Effect \*

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### Abstract

Teaching interaction is always one of the main problems in education, especially in MOOC education. In this paper, two persuasion methods of social psychology persuasion theory were used to research the influence of teachers' answers on MOOC community discussion and teaching effect. Two courses in MOOC platform are selected as the research objects, and the discussion data in community of these course are analyzed to verify the influence of teachers' answers on community discussion process. Through data analysis, it is found that teachers' answers in MOOC community discussion has a significant impact on students' discussion activity and their knowledge construction stage.

### Keywords

Teaching Interaction • MOOCs • Data Analysis • Community Discussion • Knowledge Construction

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How to improve the quality of learners' online learning on MOOC platform is a very important problem. One of the important elements of MOOC online learning is teaching interaction (Konstan, Walker, Brooks, Brown, & Ekstrand, 2015). Unlike traditional distance education, MOOC is more interactive. Because the scale of online students is very large, it is far more than the number of students in the real traditional classroom. It requires teachers to devote more energy to each student and answer each student's questions one by one for improving teaching quality. Therefore, there are discussion forums in the current MOOC. Teachers can answer students' questions in the discussion forums, and establish timely interaction with students, grade students' homework and lead discussion links.

Teaching interaction plays an important role in the teaching activity. It is the key process of realizing the re-integration of teaching and learning in online distance education. It is also the key link of in-depth analysis of the learning process of MOOC (Lee, 2003). Most teachers and students interact online through discussion forums, which play an indispensable role in the whole teaching process and knowledge transfer process in MOOC (Wong, Pursel, Divinsky, & Jansen, 2015). Exploring the influence of the teachers' discussion process in the MOOC discussion forum on teaching is conducive to providing some reference basis for the improvement of online teaching interaction, as well as providing more methods and suggestions for classroom teaching and teachers' counseling strategies.

### Related works

In 1916, Dewey mentioned that interaction is an important part of the teaching process (Rodgers, 2002). Other researchers had found that one of the key factors for the success of distance education is to increase opportunities for interaction between teachers and students, and between students and students (Abrami, Bernard, Bures, Borokhovski, & Tamim, 2011). In 2009, Zawacki-Richter used Delphi method to investigate the related topics of distance education studied by 19 international distance education experts (Zawacki-Richter, 2009). Through the investigation, 15 research topics were obtained. It was found that the most important theme was "interaction and communication in learning community". Garrison also pointed out that the problem of how teachers and learners interact with each other is the most concerned issue in the field of distance education (Garrison, 2000).

Many scholars have made research and analysis on the current situation of MOOC teaching interaction and MOOC itself from various perspectives. Zhao et al. made a meta-analysis of some research factors affecting distance education, and they concluded that the most important factor affecting the effect of distance education is interaction (Zhao, Lei, Yan, Lai, & Tan, 2005). Baird et al. analyzed the current phenomena of online course forum from a cognitive perspective, they pointed out that most students are in the situation of "personal monologue" in the process of forum interaction and lack of thinking in communication (Baird, & Fisher, 2006). Gašević et al. analyzed and investigated the current situation of MOOC teaching interaction, they collected and analyzed data on 14 MOOC platforms (Gašević, Kovanovic, Joksimovic, & Siemens, 2014). They found that there are some phenomena in MOOC teaching interaction. For example, learners have strong willingness to

interact, but the level of forum interaction is not high, students' interactive content needs are diversified, but teachers' interactive participation is not high.

Salvador *et al.*, analyzed MOOC teaching from the perspective of classification of learning activities (Salvador, & Rodríguez-Hoyos, 2016). Five types of online learning activities were proposed. Statistical data of online learning activity types of 30 MOOC courses on 6 MOOC platforms were collected and analyzed according to the scale. They found that the design of learning activities should take into account the characteristics of the platform, subjects and courses, and choose the appropriate type of learning activities. Wen *et al.* analyzed MOOC ethical value, expounded its advantages, pointed out its ethical deficiencies, and put forward suggestions (Wen, Chen, Education, & University, 2015). They think ethical value should be paid attention to and teachers' role consciousness should be changed. Hjeltnes *et al.*, probed into the essence of MOOC from the aspects of technology, internationalization, educational development and personnel training, they pointed out that MOOC realized the integration of distance education and traditional education (Hjeltnes, & Horgen, 2016).

There are also some scholars from the perspective of teachers to analyze MOOC. Liu *et al.*, pointed out that teachers should follow the law of the growth of MOOC and pay attention to the study of its essential attributes (Liu, Du, Xing, & Zhang, 2015). Grandon *et al.* studied the influencing factors of teachers' teaching behavior intention, and put forward some suggestions, such as formulating management policies, encouraging teachers to make teaching attempts, providing more external support to university teachers, and considering the corresponding regulatory effects (Grandon, Alshare, & Kwun, 2005). Yan (2015) constructed the competency model of college teachers 'teaching in MOOC', it can provide a basis for evaluating teachers' teaching competence in MOOC. Zheng *et al.* analyzed the influence of MOOC on teachers. They put forward the self-improvement strategy of teaching leadership of MOOC teachers, and gave the improvement methods and suggestions (Zheng, & Li, 2016).

## Preliminaries

### Emotional teaching

Emotional teaching refers to the process of stimulating, mobilizing and satisfying students' emotional needs by using certain teaching means with the aim of promoting teaching activities (Hargreaves, 1998). Emotion is a very important non-intellectual factor in teaching activities. It plays an important role in stimulating learners' learning motivation and creating good learning situations.

Emotion can influence learners' cognitive process. Interest is the best teacher of human beings. It has been found that in classroom teaching, students' interest in listening to classes has become a key factor. If students are not interested in it, the teaching effect is not ideal.

Emotion is an important condition for effective teaching and learning. If it is properly applied in teaching, the function of emotional phenomena can make teaching more efficient. For example, emotion can promote and hinder people's behavior, it is also called the motive function of emotion. It can promote students' learning

enthusiasm in teaching. Emotion can reduce or improve the individual's acceptance of others' words and deeds, it is also called the function of emotional guidance. In teaching, students can more easily internalize the teaching content. Emotion plays an organizing or differentiating role in people's cognitive operation activities, it is also called the regulating function of emotion. It can improve students' intelligence and learning efficiency in teaching.

### Knowledge construction

Knowledge construction is a new learning metaphor based on Constructivism (Tian 2004). Unlike face-to-face classroom teaching, MOOC has the characteristics of large-scale and openness, it breaks through the limitation of time and space, and provides a learning platform for many learners to communicate anytime, anywhere. Learners can share views with each other, exchange and collide knowledge and experience, deepen learners' understanding of problems and knowledge, and form new ideas or knowledge. In this process of communication, knowledge construction takes place.

Table 1  
*Interactive Analysis Model*

Stage	Sub stage
Stage 1: seeking common ground	A. Statement of opinions
	B. One or more participants agree to state their views
	C. An example of one or more participants providing proof of view
	D. Ask and answer questions to get the details of the statement
	E. Definition, description or identification
Stage 2: reserving differences	A. Identify and state different opinions
	B. Ask and answer questions to clarify the source and scope of different opinions
	C. Re-affirm the participants' opinions
Stage 3: negotiating	A: Negotiate or clarify the meaning of the term
	B: Negotiate views and identify their importance
	C: Identifying common or partial overlaps between conflicting concepts
	D: Propose and negotiate a new statement reflecting compromise and co-construction
	E: Integrating or accommodating suggestions including metaphors and analogies
Stage 4: revising	A: Testing the viewpoint of co-construction according to the cultural background shared by participants
	B: Testing existing cognitive models from the perspective of co-construction
	C: Testing personal experience from the viewpoint of co-construction
	D: Testing data from the viewpoint of co-construction
	E: Testing the contradictory evidence in the literature from the viewpoint of co-construction
Stage 5: consensus	A: Agreement summary
	B: Application of new knowledge
	C: Statement of participants' metacognition

In the context of online learning, knowledge construction usually takes place in the dialogue among members of the online learning community (Liu, Chen, Sun, Wible, & Kuo, 2010). Under the environment of MOOC teaching, learners' learning performance is manifested in many aspects, not only in the achievement of MOOC learning, but also in the knowledge construction generated by dialogue with other learners, teachers and assistants in the discussion forum. In fact, the process of knowledge construction refers to the process of "publishing, reading, writing and replying" among members of the online learning community. A series of

behaviors which will promote the completion of knowledge construction, such as sharing views, collision of views, and consensus-building among learners are reflected in the dialogue among members of the online learning community. In the context of Web-based learning, communication and discussion mainly convey information through words, so the information of interaction process and knowledge construction process is mostly contained in the text content of communication and discussion.

In the research of knowledge construction, the interactive analysis model is the most widely used in recent years (Zhu, & University, 2017). The model divides the process of knowledge construction into five stages: seeking common ground, reserving differences, negotiating, revising and consensus. Each stage of the model is shown in Table 1.

### The effect of teacher answers on students' discussion activity

In this paper the influence of teachers' answer on students' discussion activity is studied. Students' discussion activity is expressed by the number of times of students' post on a topic and the life cycle of the topic. The number of replies to a topic refers to the number of times a topic has been posted. In order to explore the influence of teachers' answers on the activity of discussion, we use the number of times of teachers' answers and whether teachers' answers or not to describe teachers' participation.

The following assumptions are proposed:

H1: There is a significant correlation between teachers' answers and the number of students' replies to the topic and their lifecycle.

H2: Teachers with different characteristics have different effects on students' discussion activity.

The study collects data from free discussion areas (teacher's question-answering forum, comprehensive discussion forum) and classroom discussion forum of College English Intensive Reading Course. The information recorded includes the number of responses to each topic in the discussion forum, the life cycle, and whether the teacher participates in the teacher's answers. Using factor analysis of variance, the number of students' replies and life cycles of topics with teachers' participation and those without teachers' participation were analyzed by factor analysis of variance to see whether there were significant differences between them.

In order to verify H1, we analyzed and compared the number of student responses and life cycles of topics in which teachers participated in posting or not. The number of topics that teachers participate in College English Intensive Reading Course is 206, and 51 topics that teachers do not participate in. In order to facilitate variance analysis, we sampled 51 topics that teachers participated in according to time distribution and 51 topics that teachers did not participate in. Then the students' responses and life cycle on these topics were counted.

The basic statistical analysis results of students' responses are shown in Table 2.

Table 2  
*The Basic Statistical Analysis Results of Students' Responses*

Group	Observation number	Sum	Mean value	Variance
Topics with teachers' participation	51	152	2.9386	7.1781
Topics without teachers' participation	51	41	0.8726	1.8731

The basic statistical analysis results of topic' lifecycle is shown in Table 3.

Table 3  
*The Basic Statistical Analysis Results of Students 'Topic' Lifecycle*

Group	Observation number	Sum	Mean value	Variance
Topics with teachers' participation	51	494	9.6751	158.6722
Topics without teachers 'participation	51	118	2.4312	11.5625

From Table 2 and Table 3 we can see that there were significant differences for the number of topic responses with teachers' participation and the number of topic students' responses without teachers 'participation, and lifecycle of topic with teachers 'participation and lifecycle of topic without teachers 'participation. The results supported the hypothesis H1.

Through further analysis of teachers' personal information, the number of posts and their characters, teachers' personality characteristics can be inferred. A comparative analysis of the two teachers in the course shows that there are differences in the number of posts and the textual characteristics of the two teachers. The comparison results are shown in Table 4.

Table 4  
*The Basic Statistical Analysis Results of Students 'Topic' Lifecycle*

	Teacher A	Teacher B
Sex	Female	Male
Academic degree	Master	Doctor
Frequency of posting	192	56
Text characteristics in discussion forum	When answering conceptual questions, it enriches them in detail, it is lively when answering open questions	When answering conceptual questions, it is details or quotations, when answering open questions, it is detailed, comprehensive and rigorous

It can be seen from the analysis that when teachers give solutions directly or mechanically answer questions, students will no longer be able to participate in the discussion because they know where the problems lie; while when teachers have a lively tone, they create a relaxed atmosphere for the discussion topic, which may make it easier for students to participate in the discussion.

The different personality characteristics of teachers also affect the number of teachers' answers, that is, the number of posts they send. The more times teachers answer, the more attention they usually given to students. It makes students feel that the teacher is always paying attention to the discussion of the topic, which improves the enthusiasm of students' participation and prolongs the duration of the topic. Thus, teachers with different characteristics have different effects on the activity of discussion. Therefore, the results supported the hypothesis H2.

## **Influence of text characteristics of teachers' answers on students' discussion activity**

In this section, we study the influence of the text characteristics of teachers 'answers on students' discussion activity. Teachers' text characteristics are represented by the use of teachers' emotional function words and the length of teachers' answers.

Firstly, the influence of teachers' use of emotional function words on students' discussion activity is studied. In language and writing, there is a distinction between function word and notional word. Function words generally refer to words that have no complete meaning but have grammatical or functional meaning.

We have read the relevant literature about modal words, onomatopoeia and interjections, and summarized a thesaurus containing 612 emotional function words, which summarizes the emotional function words needed in our study. In order to explore the influence of teachers' use of emotional function words on the activity of discussion, we use whether teachers use emotional function words or not and the number of times teachers use emotional function words to describe teachers' use of function words. The following assumptions are proposed:

H3: There is a significant correlation between teachers' use of emotional function words and the number of students' replies to the topic and their lifecycle.

The second study is the influence of teacher's answer length on students' discussion activity. Students' discussion activity is also expressed by the number of student responses and the lifecycle of the topic. In order to explore the influence of teacher's answer length on the discussion activity, we use the length of teacher's answer word to describe the length of teacher's answer. The following assumptions are proposed:

H4: There is a significant correlation between teacher's answer length and the number of students' replies to the topic and their lifecycle.

We also collect data from free discussion areas (teacher's question-answering forum, comprehensive discussion forum) and classroom discussion forum of College English Intensive Reading Course. The information recorded includes the number of students' replies to each topic in the discussion area, the lifecycle, whether teachers participate, the number of teachers' answers, whether teachers use function words, the number of teachers' function words, and the number of teachers' answers to each topic.

In order to verify H3, we analyzed and compared the number of student responses and lifecycle of topics in the whole sample when teachers used function words or not. The number of topics that teachers participate in College English Intensive Reading Course is 206, and the number of topics that teachers use emotional function words is 67. In order to facilitate variance analysis, we sampled 67 topics that teachers use emotional function words according to time distribution and 67 topics that teachers did not use emotional function words. Then the students' responses and lifecycle on these topics were counted.

The basic statistical analysis results of students' responses are shown in Table 5.

Table 5  
*The Basic Statistical Analysis Results of Students' Responses*

Group	Observation number	Sum	Mean value	Variance
Using emotional function words	67	164	2.4561	4.1657
No emotional function words	67	129	1.9365	2.6886

The basic statistical analysis results of topic' lifecycle is shown in Table 6.

From Table 5 and Table 6 we can see that there were significant differences for the number of students' responses and their lifecycle between teachers using emotional function words and teachers no using emotional

function words. Therefore, in this course, whether teachers use emotional function words or not is not obviously related to the number of responses to topics and the lifecycle. So, assumption H3 was not supported.

Table 6  
*The Basic Statistical Analysis Results of Students 'Topic' Lifecycle*

Group	Observation number	Sum	Mean value	Variance
Using emotional function words	67	568	8.4765	138.8962
No emotional function words	67	457	6.6683	63.7853

In order to verify H4, we counted the length of answers to each topic in which teachers participated, and analyzed the number of student responses and lifecycle of topics which teachers answered shorter and longer in the overall sample. According to the types of questions in the topic, we analyze the factor analysis of variance of the topic in conceptual and open questions respectively.

The number of topics that teachers participate in College English Intensive Reading Course is 206, and there are 56 conceptual topics. According to the length of teachers' answers, the 56 topics were sorted from low to high, and divided into two groups by median. Statistics of student responses and life cycles on these topics is shown in Table 7 and Table 8, respectively.

Table 7  
*The Basic Statistical Analysis Results of Students 'Responses*

Group	Observation number	Sum	Mean value	Variance
Teachers' answer relatively short	28	46	1.6387	1.5762
Teachers' answer relatively long	28	42	1.4982	0.4873

Table 8  
*The Basic Statistical Analysis Results of Students 'Topic' Lifecycle*

Group	Observation number	Sum	Mean value	Variance
Teachers' answer relatively short	28	198	7.2867	68.672
Teachers' answer relatively long	28	140	5.1211	46.982

There are 150 open topics. According to the length of teachers' answers, the 150 topics were sorted from low to high, and divided into two groups by median. Statistics of student responses and life cycles on these topics is shown in Table 9 and Table 10, respectively.

Table 9  
*The Basic Statistical Analysis Results of Students 'Responses*

Group	Observation number	Sum	Mean value	Variance
Teachers' answer relatively short	75	90	2.286	2.276
Teachers' answer relatively long	75	76	2.125	3.347

Table 10  
*The Basic Statistical Analysis Results of Students 'Topic' Lifecycle*

Group	Observation number	Sum	Mean value	Variance
Teachers' answer relatively short	75	293	8.362	58.963
Teachers' answer relatively long	75	232	7.014	70.156

The results show that, in both conceptual and open topics, there is no significant correlation between the length of teachers' answers and the number of responses and life cycle. That is to say, the length of teachers' answers has no effect on students' discussion activity. So, assumption H4 was not supported.

## Conclusion

Based on the persuasion theory of social psychology, we analyzed the influence of the answers of the teachers on the discussion process of forum from the peripheral and central approaches in this paper. Interactive data and related data of discussion forum of College English Intensive Reading Course were acted as research support, what is the influence of teachers' participation on students' discussion activity and what is the influence of the text characteristics of teachers' answers on students' discussion activity were carried out specific and detailed research. The conclusions of this study can provide some references for teaching practice and teachers' counseling strategies.

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