



# From “Blended” to “Integrated”: Computer Aided Online-Merge-Offline Teaching Reform Supported by MOOCs and PPT in the “Internet+” Era

Yueyue She<sup>(✉)</sup> 

School of Foreign Studies, Anhui Xinhua University, No. 555 Wangjiang Xilu Road,  
Hefei 230001, Anhui, China  
1047048511@qq.com

**Abstract.** The application of information technology in teaching has attracted more and more attention. Online-merge-offline teaching mode in the post-MOOCs era has been proved effective in improving teaching quality, but how to move from “blended teaching” to “integrated teaching” has become an important proposition worth exploring. Based on the STAPLL integrated teaching model, the research compared the average test scores of 130 participants who were divided into two groups with PPT and MOOCs as the main carrier of teaching content respectively. Description of the average score and the paired sample T-test showed that for specialized courses, the effect of using PPT as online learning materials is better than that of MOOCs. The survey results and interview also showed that the participants have a high recognition of integrated teaching based on teaching PPT. Therefore, instead of the rigid mode “online teaching + offline teaching”, the online-merge-offline teaching should integrate traditional teaching and information-based teaching based on the optimal allocation of resources. In order to achieve a greater level of teaching effect, benefit, and efficiency, teachers can use their own PPT that are made according to MOOCs from other schools or their own school to carry out personalized integrated teaching.

**Keywords:** Computer aided · Online-merge-offline Teaching · MOOCs · Teaching PPT

## 1 Introduction

With the main purpose of enhancing teaching standards and with the focus on application and practicality, the “Internet+” teaching reforms has already taken place in China. Integrated teaching is not simply “online teaching” + “offline teaching”, nor is it just adding some information technology means to traditional teaching. Integrated teaching gives full play to the effectiveness of online teaching and offline teaching through the classification of knowledge of different cognitive objectives. In this way, learners can complete knowledge learning improve their knowledge transfer ability.

## 2 Literature Review

### 2.1 Research on MOOCs in Teaching

MOOCs has become the mainstream mode of network teaching because of its great advantages. How to blend and integrate MOOCs with face-to-face teaching has become a hot topic both at home and abroad.

The school-based characteristic of MOOCs determines that the design of teaching content for class will have certain limits. MOOCs are relatively fixed, so the subsequent upgrade of the content faces various difficulties. Carrying out blended teaching based on MOOCs can maintain the good vitality of MOOCs, but how to better integrate MOOCs with the specific situation of each university so as to carry out personalized blended teaching leaves much to be discussed. Du and Wang [1] emphasize the importance of multi-dimensional mixed online teaching by organically integrating the three dimensions of teaching environment, intelligent technology and teaching behavior. College English teachers' information literacy and information technology ability are uneven [2], and lack of understanding of modern education technologies such as video capture technology and teaching video production technology has resulted in many teachers' reluctance to carry out integrated teaching [3].

### 2.2 Research on Online-Merge-Offline Teaching

Online-Merge-Offline (OMO) teaching, which is student-centered, uses technical means to combine the data from online and offline, from virtual and real learning scenes, so as to form the new ecology of online and offline integration, and realize the new teaching mode of individualized teaching and service [4]. The focus of integrated learning mode is learning rather than teaching. Generally, integrated teaching can at least be divided into two patterns [5]. One pattern is to realize online and offline synchronous teaching through a specific device. In this way, teachers and students can achieve online and offline real-time interaction without space and time limit; students online and offline can participate in learning activities at the same time [6]. The prerequisite of realizing this pattern is to modify the classroom hardware. The other pattern is to form seamless connection between online and offline teaching, and form a new form of online and offline integrated teaching through mutual support and organic coordination.

OMO teaching mode combines blended learning and integrated learning, and promote smart learning [7]. Many training institutions offer online training to students on weekdays, and let students attend offline training over the weekend. Online and offline teaching content is closely related but seldom alike. Online teaching and offline teaching share complementary advantages. This study carries out a one-semester OMO teaching practice by using teaching PPT and MOOCs as online learning materials for students, analyzes the influence of different extra class learning materials on teaching quality in OMO teaching mode, and provides a certain reference for the optimization and upgrading of MOOCs and the application of OMO teaching in the post-MOOCs era.

### **3 Research Design**

#### **3.1 Research Issues**

In this study, 135 students from two classes of grade two in a university in Anhui Province in China were selected as the research objects, and the OMO college English teaching based on PPT and MOOCs was carried out at the same time. The effects of two different learning material on OMO college English teaching were compared after a semester of research. The research aimed to answer the following two questions:

If teaching PPT and MOOCs are respectively taken as online learning material and OMO teaching is carried out alternately, is there any difference in the scores of the students? If there are, what are the differences?

How well do the students approve of OMO teaching based on teaching PPT and MOOCs?

#### **3.2 Research Methods**

The research was carried out through teaching experiment, questionnaire survey and interview. In the whole process of OMO teaching experiment, students use the same learning material and teachers use the same teaching materials (courseware, exercises, tests, etc.). The variable is the online learning material, respectively teaching PPT and MOOCs.

#### **3.3 Teaching Experiment**

The teaching experiment was conducted in the autumn semester of 2021, that is, from September 2021 to January 2022. The subjects used teaching PPT and MOOCs as online learning materials in alternate units. During this period, eight procedural tests, one questionnaire survey and one interview were carried out. The data of five students who did not participate in all the procedural tests and questionnaires were excluded, and the valid data of 130 students were obtained. The researchers also interviewed some of the participants and the teachers who taught them.

##### **1) Design of Teaching PPT and MOOCs**

We designed five sections of PPT for the selected articles: lead-in, cultural background, global understanding, and detailed reading (key and difficult language points and grammar) and text appreciation (stylistic characteristics, narrative skills, cross-cultural communication, writing skills, etc.). After students finish PPT learning, they will receive face-to-face instruction from teachers in class. Teachers will check and strengthen key knowledge and cultivate language ability through interactive methods such as question-and-answer, discussion, games and tasks. As for MOOCs, we also designed the corresponding five sections, covering all the knowledge that must be learned before class. After learning the MOOCs, students would participate in the same in-class activities.

##### **2) Design of OMO Teaching Activity**

There are six lessons for each text in OMO teaching activity. In class, the teacher would check the students' online learning, solve the personalized problems of the students,

and restrengthen the key and difficult knowledge of the text. In the first three lessons, students’ mastery of the background knowledge, text structure and content mentioned in the video would be checked by asking questions, judging true or false, multiple-choice questions, matching practice and games. In the last three lessons, students will learn more about language points and writing techniques. The teaching activities mainly include testing, sentence construction, translation, sentence imitation and writing.

This study is based on the STAPLL integrated teaching model [8]. Students’ online and offline learning activities are connected. Task-based language learning, activity-based language learning and project-based language learning are integrated into the whole learning process. The teaching activity design takes learning as the center and realizes an organic teaching ecosystem that integrates online and offline closely. In this study, the biggest difference in teaching activity design lies in whether PPT or MOOCs is the main carrier of teaching content. Other teaching contents and activities are completely consistent.

### 3) In-Class Test

It is very important to detect students’ online learning effect in OMO teaching. In this study, online learning effect of students was tested by “questionnaire star” during face-to-face teaching. The test questions are closely related to the key and difficult knowledge of the online learning content of students, and are designed in the same principle, the same type of questions and the same number of questions. The test content varies from unit to unit and the difficulty is similar. There are 20 short questions in total, all objective questions, including multiple choice questions, grammar fill-in-the-blank questions, word meaning matching questions, etc., with a full score of 100 points. The purpose of the test questions is to urge students to take online learning seriously on the one hand, and also to test the effect of online learning on the other hand.

#### 3.4 Questionnaire and Interview

At the end of the teaching experiment, the participants were surveyed by questionnaire. A total of 130 valid results were obtained by online questionnaire. The questionnaire mainly investigated the specific situation of learners’ online learning PPT and MOOCs, their preference for the two different learning material carriers, and their suggestions on the design of teaching experiments. The interview was designed to know about the acceptance of PPT and MOOCs as an online learning material for integrated teaching.

## 4 Research Data and Results

### 4.1 Comparison of Test Scores

After excluding the scores of five students who did not fully participate in the eight tests, we compared the average scores of the in-class tests of 130 participants, and statistically found that the average scores of students who participated in the in-class tests after learning teaching PPT online were slightly higher than those who participated in the in-class tests after learning MOOCs (Table 1).

**Table 1.** Description of the average score of the in-class test

	Learning carrier	Average value(E)	Number of participants	Standard deviation	Mean standard error
Participants	PPT	57.27	130	12.913 9	1.115 1
	MOOCs	55.18	130	11.302 0	1.016 1

**Table 2.** Paired sample T-test of the participants’ average score in the in-class test

	Learning carrier	Average deviation(E)	Standard deviation	Standard error	t	Degree of freedom	p (two-tailed)
Participants	PPT-MOOCs	2.09	9.74	.82	2.54	139	.012

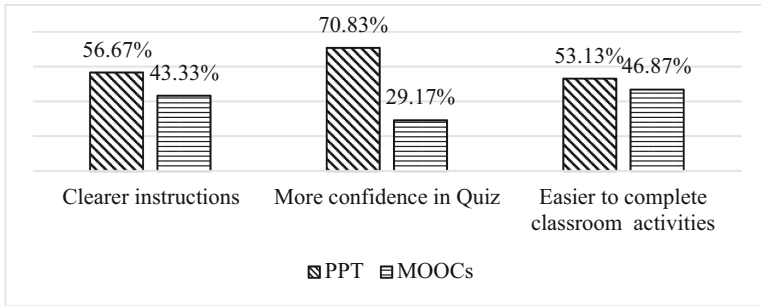
Paired sample T-test showed that the mean difference between the two was 2.09, and the two-tail T test  $p = 0.012 < 0.05$ , indicating that the average score of the in-class test based on teaching PPT and MOOCs was different, and the difference reached the level of statistical significance (Table 2). The OMO teaching effect based on teaching PPT is better than that based on MOOCs. However, from the average, the results of the two groups are not ideal, neither of them reaches the pass score.

## 4.2 Acceptance of Different Materials

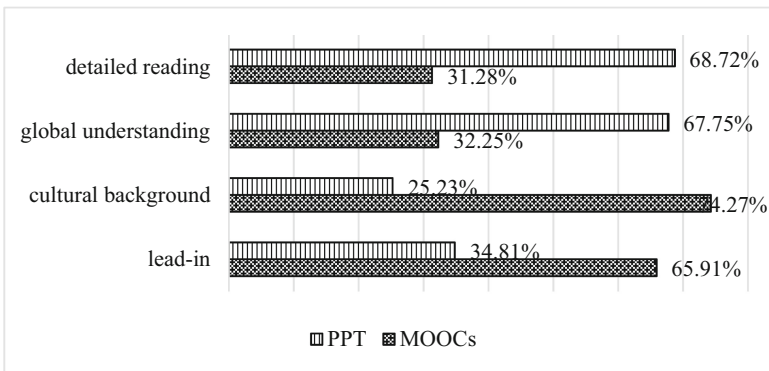
### 1) Survey Results

At the end of the experiment, we received a total of 130 valid questionnaires. The results are analyzed as follows. Learners can better accomplish online learning materials: According to the survey results: 49.98% of the participants prefer to use teaching PPT as the online learning material, 35% of the participants like to use MOOCs as the online learning material for fusion teaching, and 15% of the participants dislike both materials, that is, they reject the OMO teaching itself. As online learning materials, teaching PPT and MOOCs videos have their own advantages: The participants rated MOOCs as “more interesting” and “easier to understand”, while PPT slides were “more flexible, time-efficient, autonomous and relevant to the class”. As online learning materials, teaching PPT has better effects than MOOCs: The participants thought that with PPT they can “obtain clearer learning task instructions”, “have more confidence when taking tests” and “complete classroom activities more easily” (Fig. 1).

Further analysis shows that the participants think that they are more inclined to use PPT as the online learning material carrier in terms of “detailed reading” and “global understanding”. For “cultural background” and “lead-in”, they prefer MOOCs (Fig. 2). The videos have rich forms, which is very conducive to presenting the content of the cultural background and the lead-in section since the videos are clearer and easier to



**Fig. 1.** Results of investigation on the effect of using two kinds of online learning materials



**Fig. 2.** Survey results of participants' preference for online learning materials in different learning sections

understand. PPT is more advantageous to present the global understanding and detailed reading sections.

## 2) Interview

We interviewed 10 students randomly. The students were directly asked “Which do you prefer for self-directed learning before class, PPT or MOOCs? Why?” Five students chose videos. They think that “MOOCs with the teacher in the video is more cordial”, “the video is more interesting”, “the explanation in MOOCs is more vivid” and “the content of the video is richer”. The other four students chose the teaching PPT. They think that “the content of PPT is more detailed”, “it is easier to find the key points quickly through the teaching PPT”, “the speed of the learning progress of the teaching PPT can be adjusted by themselves, while that of MOOCs can only be followed by the teacher in the video”, “it is convenient to record, check and take notes with PPT, and you can skip what you already know”, “Video is not as flexible as PPT, and PPT is also very convenient and rich in content”. One student suggested the combination of the two, because “both have their advantages and disadvantages, and the combination of the two would be better.”

## 5 Conclusions

Through quantitative and qualitative research, this study finds that online learning content can be in the form of teaching PPT or MOOCs video when conducting OMO teaching. The production of teaching PPT is relatively less complicated, so the two forms of PPT and MOOCs can be combined to carry out personalized OMO teaching so as to achieve individualized teaching and improve teaching quality. For OMO first-class courses construction, the advantages of PPT and MOOCs can be fully combined. Teachers can use their own PPT made according to MOOCs from other schools or their own school to carry out personalized integrated teaching to achieve a greater level of teaching effect, benefit, and efficiency.

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