Application of Blending Teaching Based on MOOC in the Training of Undergraduate Nursing Students' Cardiopulmonary Resuscitation Skills

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Abstract. The purpose of the paper is to discuss how to carry out the blending teaching in the training of undergraduate nursing students' cardiopulmonary resuscitation (CPR) skills and its effects. The method is selecting two groups of nursing students randomly from Class 1, Class 4 and Class 2, Class 3 who are general undergraduates of 2014 and are learning the operation of CPR with the course Basic Nursing. They were respectively divided as the control group and the experimental group. In the control group, the teaching was carried out in the form of traditional teacher demonstrations. The experimental group adopted the blending teaching mode based on MOOC of Basic Nursing. it is the combination of learning and discussing of online courses and demonstration and answering in class. The result of examination on CPR shows a statistic difference ($P<0.05$) between the two groups. Considering the result, the conclusion is that the blending teaching based on MOOC resources is more in line with the learning needs of undergraduate nursing students on CPR skills as beginners. It effectively implements the harmonious unification of "teaching" and "learning", and enhances the training effect of CPR.

Introduction

MOOC (massive open online course) is a new revolution in classroom teaching based on information technology and network resources.[1] The rise of MOOC offers opportunities for the revolution of nursing education, but it also has its limitations, such as online teaching, which cannot completely replace face-to-face classes. Blending learning is a combination of the advantages of both traditional learning and Internet learning. That is to say, it is necessary to play a leading role in guiding, enlightening and monitoring the teaching process, and fully reflect the students' initiative, enthusiasm and creativity as the subject of the learning process.[2] Cardiopulmonary resuscitation (CPR) technology is the key and difficult part of the course Basic Nursing. It is the first aid skills that must be mastered by nursing students. However, the research shows that the traditional teaching methods have not fully mobilized the active participation of nursing students, and the theory and practice are not closely combined. [3] This study is to apply the blending teaching in the training of undergraduate nursing students' cardiopulmonary resuscitation (CPR) skills. The new teaching mode is more conform to the learning needs of undergraduate nursing students on CPR skills as a beginner, and it also has received good effects. The report is as follows.

Objects and Methods

Teaching objects and groups. Selecting the undergraduate nursing students who are general undergraduates and are studying the operation of cardiopulmonary resuscitation (CPR) in the course

Basic Nursing in the school. The experiment randomly assigned Class 1 and 4 as the control group, and Class 2 and 3 as the experimental group. There were 49 students in the control group, with 44 females and 5 males. The average age was 20.35±1.96; There were 54 students in the experimental group, with 48 females and 6 males. The average age was 19.88±2.05. Due to the large number of two groups, each group was taught twice to ensure the effectiveness of the teaching. The two groups of nursing students were admitted through the national unified examination, and they had the same curriculum. The course Basic Nursing was both offered in the first term of their sophomore year and was taught by the same teacher, in both theory and experiment. Moreover, there was no statistically significant differences between the two groups in age and sexuality ($P>0.05$), which made them comparable.

Teaching Methods. The operating standards of the two groups were based on the Update of American Heart Association Cardiopulmonary Resuscitation and Cardiovascular Emergency Guide in 2015. The teaching time was 5 period. All teachers used uniform grading standards to conduct operation exams in the last period.

The Traditional Teaching Mode of the Control Group. After the teacher demonstrated in the experimental class, the students practiced themselves in groups of three, and the teacher answered their questions by walking around the classroom.

The Blending Teaching Mode of the Experimental Group Based on MOOC in the Course Basic Nursing. It was taught by both online video courses with discussions and classroom demonstrations and mentoring. In the pre-class preparation stage, firstly, the course Basic Nursing set by Hubei University of Medicine on the platform of PMPHMOOC was chose as an online learning resource for CPR skills. Secondly, with the help of QQ group, a forum of course learning was established to realize the teaching functions based on network such as learning communication, subject discussion, resource sharing, independent learning and group collaborative learning. Then, in a week before the class, the teacher issued corresponding teaching resources to the course on the forum, and listed autonomous learning tasks before class. Students arranged their time to learn and watch the video according to the task order within a week. In the process of self-study, when they met any problems, they could discuss with other students or teachers at any time through QQ, or they could find answers to questions through the network resources given by the teacher. In class, firstly, one student was chosen from each group to do a CPR operating demonstration, and put forward any problems while learning. After that the other students could ask questions, show their opinions, or give more details. The teacher then solved the problems by demonstration and guidance. Then the students practiced and did examination in groups. At last, the teacher did evaluation and summary according to students' condition such as their operation, their questions and their online learning and discussion.

Examine Grade. According to the unified theory examination and the mark sheet of operation test made by Update of American Heart Association Cardiopulmonary Resuscitation and Cardiovascular Emergency Guide in 2015, the exam was set in hundred-mark system, and the basic knowledge and basic skills were both included. The theoretical exam was based on objective questions and there were 20 questions. The operation time was 5 minutes. After the timeout, the operation score would be deducted according to the value of the unfinished project. In order to improve the precision, there were 2 recorders. The two recorders recorded the time of 30 times' extrathoracic compressions, the time of artificial respiration, the time of consciousness judgment and the time of carotid pulsation judgment in 5 cycles.

Effectiveness Evaluation. The evaluation of teaching effect was carried out by the self-prepared Questionnaires of the Satisfaction of Blending Teaching Based on MOOC. The Internet platform was used to import scale and questionnaires and produced a QR code. At the end of the course, students in the experimental group were able to use their mobile phones or tablet computers to scan the QR code and then fill in and submit the questionnaires on the spot. The recovery rate was 100%.

Statistical Analysis. The SPSS 17.0 software was adopted, the measurement data was tested by t-test of two independent samples, and the counting data was expressed as percentage (%), and the comparison between the two groups was measured by $\chi 2$, and the test level was $\alpha=0.05$.

Conclusion

The Comparison of the Theoretical and Operation Grades between the Two Groups. According to Table 1, the theoretical and operation grades of the experimental group were statistically significant compared with the control group ($P < 0.01$).

Table 1: The comparison of the theoretical and operation grades between the two groups

Group	Number of cases	Theoretical grades	Operation grades
Control group	49	77.31±14.72	81.46±8.89
Experimental group	54	96.25±5.82	98.43±4.26
t		6.506	6.842
P		0.000**	0.000**

PS：*P＜0.05，**P＜0.01

The Comparison of Operation Accuracy between the Two Groups. As shown in Table 2, the experimental group was statistically significant ($P < 0.05$) compared with the control group in the accuracy of judging consciousness, judging carotid pulsation, extrathoracic compressions, and open airway.

Table 2: The comparison of operation accuracy between the two groups (n，%)

Projects	Control group	Experimental group	χ^2	P
judging consciousness	40 (81.6%)	52 (96.3%)	5.791	0.016*
judging carotid pulsation	42 (85.7%)	53 (98.1%)	5.544	0.019*
Extrathoracic compressions positioning(5 times average)	40 (81.6%)	54 (100%)	10.868	0.001**
Extrathoracic compressions frequency(5 times average)	39 (79.6%)	51 (94.4%)	5.139	0.023*
Extrathoracic compressions depth(5 times average)	41 (83.7%)	52 (96.3%)	4.669	0.031*
Open airway effectiveness(twice average)	37 (15.5%)	49 (90.7%)	4.324	0.038*
Manual ventilation effectiveness(twice average)	42 (85.7%)	51 (94.4%)	2.234	0.135

PS：*P＜0.05，**P＜0.01

The Evaluation of the Teaching Effect among Nursing Students in the Experimental Group. Through Table 3, it is easy to see that the satisfaction index of each evaluation is above 88.9%, indicating that the nursing students have high satisfaction with the blending teaching mode based on MOOC during CPR skills training.

Table 3: The evaluation of the teaching effect among nursing students in the experimental group (n，%)

Evaluation projects	Satisfaction	Normal	Dissatisfaction
Be helpful to the communication between teachers and students and students themselves	52 (96.3%)	2 (3.7%)	0
Be helpful to improve students' enthusiasm and enhance their learning effect	50 (92.6%)	4 (7.4%)	0
Be helpful to check the effect of learning, to check the shortage in time, to improve the students' ability of self-learning	48 (88.9%)	4 (7.4%)	2 (3.7%)
Be helpful to improve students' ability to analyze and solve problems	50 (92.6%)	3 (5.5%)	1 (1.9%)
Be helpful to cultivate students' ability of unity and cooperation	49 (90.7%)	4 (7.4%)	1 (1.9%)

Discussion

Following the Rules of Human Cognition, Combining the Theory and Practice Closely, and Improving the Accuracy of Operation. It is shown in the Table 1 that the grades of the theory examination and the operation test in experimental group are statistically significant compared with those of the control group. Because the blending teaching mode based on MOOC follows the rule of

human cognition. This mode is carried out in the form of " learn online before class - demonstrate in class(students) –demonstrate and guide(teachers) - strengthen practice(students)" to combine theory with practice closely, which makes students in a higher degree of cardiopulmonary resuscitation (CPR) skills in both theory and practice. Any of the steps in the operation of the manual CPR operation, the accuracy of any links, will directly affect the quality and the effect. [4] As shown in Table 2, the experimental group shows statistical significance in judging consciousness, judging carotid pulsation, extrathoracic compressions, and the precision of open airway compared with the control group. When students are learning online by using the blending teaching mode based on MOOC, they can repeat watching the videos if they don't understand the content, and they can also discuss through QQ platform with other students or teachers, and refer to the material themselves. The demonstration in class will also further reveal the existing problems so that the students can do purposeful practice. The teacher can also focus on the key points and explain deeply. They can do theoretical guidance in practice, so as to improve the understanding of nursing students for CPR operating precision.

The Good Teaching Effect, Which Puts Students as the Main Body and Satisfies their Diverse Need. Table 3 shows that nursing students have high satisfaction with the blending teaching mode based on MOOC in CPR skills training. Traditional CPR skills training methods is given priority to teacher's teaching, ignoring students' main body status, so that the students only passively accept operation skills. What's more, the students' individual differences can't get enough attention. Thus, the training effect is not ideal, which causes the traditional way of training can't meet the demand of students' training in CPR skills. [5] The blending teaching based on MOOC has its own advantages in the information age. Students' online learning is no longer restricted by time and space. Students can arrange their learning progress and time. They can use QQ platform for autonomous learning and discussion anytime and anywhere, which embodies the students' subject status and satisfies the students' diverse need. [6] In the background of the “Internet +”, as nursing higher education, we should actively carry out the education teaching reform of online and offline integration. In this teaching mode, students no longer passively accept and practice the operation all together after demonstration. Instead, they used MOOC resources to preview and find the problems before class. Each student should explore the existing problems during the class, strengthen practice, check the study effect. This mode can timely find the weak points and improve students' interest. Thereby it can combine "teaching" and "learning" and improve the teaching effect.

The blending teaching based on MOOC is carried out for undergraduate nursing students who are beginners in the training of CPR operation. By making full use of MOOC resources before class, discussing with each other online, and enlightening students by teachers in class, the new teaching mode has not only changed the past mode that only focused on practical ability of nursing students, but also paid more attention to the internalization of knowledge in order to make the practice be better guided by theory. It has also improved the students' study enthusiasm, and enhanced the learning effect. This mode has absorbed the advantages of pure MOOC mode and traditional teaching mode, and has made up for the deficiency of the two above. The students' satisfaction with their teaching effect is high. Thus, it deserves being popularized.

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