Research Article

Application of Flipped Classroom Mode based on Moso Teach in the Laboratory Course of Emergency Nursing

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Abstract

Objective: To explore the effectiveness of flipped classroom mode based on Moso teach in the laboratory course of Emergency Nursing. Methods: Two classes of vocational nursing students in grade 2016 were randomly assigned to the experimental group (n=30) and the control group (n=29) by lottery. Flipped classroom mode based on Moso teach and traditional teaching were used in the experimental group and the control group, respectively. The skill examination scores, and autonomous learning ability were compared between the two groups after the course. And the new teaching model was evaluated in experimental group after the course. Results: The skill examination scores (t=2.43，P<0.05) and autonomous learning ability (t=4.95，P<0.01) of the experimental group were significantly higher than the control group after the course. And the satisfaction evaluation of new teaching model in experimental group is 93.33%. Conclusion: Flipped classroom mode based on Moso teach was accepted by students and can effectively improve students' clinical skill and autonomous learning ability.

Key words: Moso Teach, Flipped Classroom, Emergency Nursing, Teaching.

Introduction

Moso tech is a mobile instructional software which is based on mobile internet can immediately feedback the teaching effect both in and out of classroom (1). It has many functions such as resources push, and the teacher helps students internalize knowledge in the classroom (2).The flipped classroom mode based on Moso teach combines e-learning and face brainstorming, discussion, test and so on which provides a good platform for the education informationization. Flipped classroom is a subversion of the traditional teaching mode. It readjusts the time inside and outside the classroom, student's complete knowledge learning before class to face classroom learning which provides students individualized learning environment and embodies the " student-centered" teaching philosophy. This

study applied the flipped classroom mode based on Moso teach in the laboratory course of Emergency Nursing and achieved good teaching effect, now report as follows.

Materials and methods

Subjects

Two classes of vocational nursing students in grade 2016 were randomly assigned to the experimental group (n=30) and the control group (n=29) by lottery. Flipped classroom mode based on Moso teach and traditional classroom teaching were used in the experimental group and the control group, respectively. There had no statistical differences of gender, age, scores of college entrance examination and early medical foundation courses' grade between the two groups (P>0.05).

Teaching methods

The teacher, teaching hours, teaching schedule and teaching materials were the same of the two groups' students.

1. Flipped classroom mode based on Moso teach

The experimental group applied flipped classroom mode based on Moso teach, which had three stages of self-study before class, classroom teaching and consolidation of knowledge after class. (1) Self-study before class ① Teacher's preparation before class. Teachers set up the course of Emergency Nursing in the App of Moso teach students could join in the course by the invitation code. Five lab teaching projects of Emergency Nursing Curse were used as the teaching content in flipped classroom, which were "pre-hospital triage", "cardiopulmonary resuscitation (CPR)", "defibrillation", "Heimlich Maneuver" and "electrocardiogram monitoring". Before class, the teacher prepared teaching materials including learning tasks, teaching micro videos, teaching courseware, tests, homework and related information. For example, in the experiment teaching of CPR, students could understand the learning goals,

methods and contents of the experiment by the learning tasks; the teacher made teaching videos according to key points of the experimental operation such as "evaluating environment", "judging patient's consciousness", "activating the emergency rescue system", "judging patient's breathe and pulse", "putting the resuscitated position", "compressing the chest", "cleaning and opening the airway", "breathing" and "accessing the resuscitated effect", and helped students to self-study before class combining with the courseware. Besides, the teacher created a test database to test students before, during and after class. According to the test results and combined with discussions about students' study situation, the teacher could accurately grasp the teaching difficult points. In addition, students were asked to accomplish homework such as rehearsing scene play about CPR in/outside hospital which would be reported in class. Meanwhile, the teacher uploaded some related materials to the Moso teach to help students' study. All teaching materials were assigned empirical value, the teacher could not only know every student's learning process, but also know their empirical values for detail, which would help the teacher to have a comprehensive understanding of students' learning situation. The teaching materials would be uploaded to the Moso teach a week before class, so students could download to learn. ② Students' self-study before class Students could log on to Moso teach to download the learning materials and self-study according to their own learning progress. When they had questions, they could discuss with other students and the teacher on Moso teach. Besides, students should complete the tasks as a group and summarize the study achievements and problems to be shared in class. (2) Classroom teaching ① Attendance check The teacher can use the check-in function of Moso teach to know students' attendance. ② Report on learning Students performed the scene play about CPR in/outside hospital as a group in class and reported the learning situation. ③ Review of the teacher and

students   The teacher reviewed the general situation of each group and organized the students to conduct mutual evaluation. Common problems would be explained in class and personality problems would be one-to-one interpreted after class. ④ Demonstration of operation   The teacher gave a demonstration on the first-aid skills of CPR. ⑤ Practice instruction   The teacher organized students to exercise on CPR simulators in group and tour instructed. ⑥ Spot check   Students were selected randomly to demonstrated the operation in class. ⑦ Vote for selection   Vote on the "Best Power Group" before the end of class, which not only activated the classroom atmosphere, but also promoted the collaborative learning of group team. (3) Consolidation of knowledge after class   Students were tested after class and asked to upload the video of results of the exercise to Moso teach. The teacher checked the homework and gave scores. If the students still have questions about the contents of the study, they could exchange and discuss in the question-and-answer area of Moso teach to consolidate their knowledge.

2. Traditional classroom teaching mode

The tradition classroom teaching mode was adopted in the control group. The teaching contents were explained theoretically, operated and demonstrated by the teacher in class. Students were instructed to practice in groups and spot-checked to demonstrate. At last, the teacher would summarize the general difficulties of the teaching contents.

3.   Methods of evaluation

3.1. Skill examination   At the end of the course, two groups of students were assessed with the same scoring standards of skills by the same professional teacher who did not know the situation of students' grouping by using the blind method of the evaluator.
3.2. Autonomous learning ability assessment
Before and after teaching, two groups of students were assessed by the autonomous learning ability scale of nursing students (3). The scale included 28 items in three dimensions of self-management, information ability and learning cooperation ability. The Likert 5 score system was adopted, and the score range was 28 scores to 140 scores. The higher the scores were, the well the autonomous learning ability was. The Cronbach's a coefficient of the scale was 0.863. Before and after teaching, a total of 118 questionnaires were distributed and retrieved on the spot with effective recovery rate of 100%.

3.3. Teaching model evaluation   After teaching, the students of the experimental group were investigated by self-designed questionnaire to evaluate the flipped classroom mode based on Moso teach. The questionnaire included 9 items: learning time, the enthusiasm of learning, the interest of learning, the ability to analyze and solve problems, knowledge, skills, communication, team spirit and satisfaction. The answers of each item were agreed, uncertainty, disagree.   The Cronbach's a coefficient of the scale was 0.721. Totally of 30 questionnaires were distributed and retrieved on the spot with effective recovery rate of 100%.

4. Statistical method

Software of SPSS17.0 was used for statistical analysis. Mean and standard deviation, frequency and rate were used to describe the data. Chi-square test was used to compare the gender composition of the two groups. Two independent samples t test was used to compare the differences of age, scores of college entrance examination, early medical foundation courses' grade, scores of skill examination and autonomous learning ability between the two groups. Paired sample t test was used to compare the differences of autonomous learning ability intra-groups pre- and post-teaching. The differences had statistical significance when the P-value was less than 0.05.

Results

1. Comparison of scores of skill examination between two groups

The scores of skill examination in experimental group were (81.82±6.47), and the scores of skill examination in control group were (77.60±5.99). The scores of the two groups were statistically different ($t=2.43$，$P=0.02$).

2. Comparison of autonomous learning ability between two groups before and after teaching

There was no statistical difference of autonomous learning ability between two groups before teaching ($P>0.05$). After teaching, the total scores of autonomous learning ability, scores of self-management and scores of learning cooperation ability were higher than pre-teaching in experimental group ($P<0.01$) and were higher than those of control group ($P<0.01$). In the control group, only the scores of self-management ability were significantly different from that before teaching ($P<0.05$). (Table 1)

3. Evaluation of the flipped classroom mode based on Moso teach in the experimental group (Table 2)

Table 1 Comparison of autonomous learning ability between two groups before and after teaching ($\overline{x}±s$)

Group		Self-management ability	Information ability	Learning cooperation ability	Scores
Experimental group (*n*=30)	Pre-teaching	31.33±4.52	35.50±4.21	25.94±3.56	92.80±7.77
	Post-teaching	36.40±2.79	36.33±1.88	28.03±2.55	100.77±4.56
Control group (*n*=29)	Pre-teaching	30.86±4.25	34.69±4.68	26.48±3.40	92.03±8.55
	Post-teaching	32.86±2.74	35.21±4.50	26.10±2.21	93.66±6.37
t_1		0.41	0.70	-0.57	0.36
t_2		-6.23*	-0.97	-4.11*	-7.71*
t_3		-2.24#	-1.95	0.76	-1.48
t_4		4.92*	1.25	3.10*	4.95*

Notes: t_1: Comparison between the two groups before teaching, t_2: Comparison intra-experimental group pre- and post-teaching, t_3: Comparison intra-control group pre- and post-teaching, t_4: Comparison between the two groups after teaching; "#": $P<0.05$, "*": $P<0.01$

Table 2 Evaluation of the flipped classroom mode based on Moso teach in the experimental group (*n*=30) [*n*(%)]

Evaluation of items	Agree	Uncertainty	Disagree
Flexible learning time	30 (100.00)	0 (0.00)	0 (0.00)
Arousing the enthusiasm of learning	28 (93.33)	2 (6.67)	0 (0.00)
Inspiring the interest in learning	25 (83.33)	5 (16.67)	0 (0.00)
Improving the ability to analyze and solve problems	29 (96.67)	1 (3.33)	0 (0.00)
Benefit for the mastery of knowledge	26 (86.67)	2 (6.67)	2 (6.67)
Benefit for the mastery of skills	30 (100.00)	0 (0.00)	0 (0.00)
Promoting effective communication	27 (90.00)	3 (10.00)	0 (0.00)

between teachers and students			
Improving team spirit	27 (90.00)	2 (6.67)	1 (3.33)
Satisfied with this teaching model	28 (93.33)	2 (6.67)	0 (0.00)

Discussion

1. Flipped classroom mode based on Moso teach had a good teaching effect and promoted the reform of educational informatization

Flipped classroom mode based on Moso teach can not only help teachers to carry out teaching activities inside and outside the classroom according to the teaching needs, but also break the limits of working in school. Besides, it can enable students to learn at any time and place and meet the needs of students using mobile internet to obtain a large amount of information (1). In the experimental teaching of emergency nursing, the teacher uploaded teaching resources to Moso teach before class and instructed students to self-study, to save the time of taking notes in class and make students have more time to exercise. Especially in the extracurricular open laboratory, the teacher can not to be present to guide, but students can learn the key points of operation through video and pictures which can help students to guide and regulate their own operation. In this study, the scores of skill examination in experimental group were higher than that of the control group, and the difference is statistically significant (P<0.05). This teaching mode had changed the traditional passive teaching, fully mobilized the students' learning enthusiasm, and improved the teaching effect. The previous research which applied flipped classroom mode based on Moso teach in other courses such as medical functional science (4), histology and embryology (5), nursing foundation (6) and so on, had also achieved good teaching effect. The students in the experimental group were investigated by the questionnaire, all of them thought that the learning time of flipped classroom mode based on Moso teach was flexible and this teaching mode was conducive to the mastery of the skills.   More than 90% of the students thought that this teaching mode aroused the enthusiasm of learning, improved the ability of analyzing and solving problems, promoted the effective communication between teachers and students, and improved the spirit of team cooperation. 93.33% of the students were satisfied with the teaching mode. In addition, it was helpful to promote the reform of educational informatization by applying Moso teach to reverse classroom teaching. Information society requires educational informatization, and the core content of educational informatization is the teaching information. It is to make teaching means technicalization, educational dissemination informationization and teaching methods modernization. Moso called is the reform of teaching means and methods. In the information age, both teachers and students should become mobile learners and carry out teaching and learning by mastering mobile information technology which can make learning no longer limited by time and space.

2. Flipped classroom mode based on Moso teach was helpful to improve autonomous learning ability

Autonomous learning ability refers to the ability of learners to be responsible for their own learning, to define learning goals, to plan and implement learning plans according to their own circumstances, and to assess learning results (7). Flipped classroom mode based on Moso teach provided the time and space for students to learn independently, so that the students can control the learning rhythm according to their own learning ability, besides, the effective arrangement and management of extra-curricular time had also promoted the improvement of self-management ability (8). In addition, students need to complete their study tasks in groups and show them in class, which required students to work separately and cooperate with each other to overcome the

difficulties in learning. It improved students' ability of learning cooperation while enhancing their senses of learning participation (9). As to the knowledge that cannot be understood in pre-class self-study, students need to consult database resources, medical websites and library to look for information to solve problems independently, which was helpful to improve information ability. Wang, Zhou, and Lin (10) applied mobile teaching of Moso teach while nursing basic technology, which had effectively improved students' autonomous learning ability. In this study, the total mean scores of autonomous learning ability, scores of self-management ability and scores of learning cooperation ability of the experimental group were higher than those of control group after teaching, and the differences were significant (P<0.01). Therefore, flipped classroom mode based on Moso teach was helpful to improve students' autonomous learning ability, especially in terms of self-management ability and learning cooperation ability.

Conclusion

In a word, flipped classroom mode based on Moso teach accords with the needs of educational information reform, and it emphasizes the main position of students. Through the application of information technology, it not only arouses students' enthusiasm for learning, but also puts forward higher requirements for teachers. It is a kind of teaching method which is worth applying and popularizing.

Declaration

1) Consent to publication
We declare that all authors agreed to publish the manuscript at this journal based on the signed Copyright Transfer Agreement and followed publication ethics.
2) Ethical approval and consent to participants
The research had been approved by ethics and all participants agreed to take part in.
3) Disclosure of conflict of interests

We declare that no conflict of interest exists.
4) Funding
None.
5) Availability of data and material
We declare that the data supporting the results reported in the article are available in the published article.
6) Authors' Contributions
Authors contributed to this paper with the design (WD), literature search (WD and RS), drafting (WD and RS), revision (WD and RS), editing (WD and RS) and final approval (RS).
7) Acknowledgement
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8) Authors' biography
None.

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