

# Exploration and Application of the Flipped Classroom Based on Outcome-Oriented Educational Principles in Vocational Nursing Practical Training

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**Abstract:** *Purpose:* To explore the practical effects of using the flipped classroom approach based on outcome-oriented educational concepts in nursing practical training at vocational colleges. *Methods:* From February 2023 to February 2024, a total of 62 nursing trainees from our school were sampled and randomly divided into a study group and a control group using a randomized controlled trial design, with 31 students in each group. The control group received conventional training, while the study group received practical training based on the outcome-oriented educational concept in flipped classrooms. Comparison was made between the two groups on assessment scores, teaching satisfaction, and self-directed learning ability ratings. *Results:* Statistical comparisons showed that the study group's assessment scores, teaching satisfaction, and self-directed learning ability ratings were significantly higher than those of the control group ( $P < 0.05$ ). *Conclusion:* The flipped classroom model based on outcome-oriented educational concepts in nursing practical training at vocational colleges can improve students' assessment scores and self-directed learning abilities, and enhance teaching satisfaction, demonstrating potential for wider application and dissemination.

**Keywords:** Outcome-oriented educational concept; Vocational education; Nursing practical training

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## 1. Introduction

Practical training is an integral part of vocational nursing education, enhancing students' ability to apply theoretical knowledge to real-world scenarios, enabling proficiency in various nursing procedures, and facilitating early adaptation to clinical work processes, thereby fostering favorable conditions for future professional roles <sup>[1]</sup>. Currently, vocational nursing practical training faces numerous challenges, notably insufficient teaching staff, limited training resources, and outdated teaching methods, hindering students from

mastering nursing skills effectively and thus failing to meet the comprehensive requirements of clinical nursing practice<sup>[2,3]</sup>. The key principle of outcome-oriented education is to prioritize learning outcomes as the guiding principle of instruction, focusing on cultivating students' core competencies as primary educational objectives. Flipped classrooms involve dividing lessons into two parts, with students at the center of learning and teachers primarily facilitating and inspiring their learning process. Some vocational colleges have successfully applied flipped classrooms based on outcome-oriented educational concepts in nursing education, achieving positive outcomes<sup>[4,5]</sup>. Based on this premise, this study investigates the application effects of flipped classrooms based on outcome-oriented educational concepts among 62 nursing trainees at our institution.

## **2. Data and methods**

### **2.1. General information**

From February 2023 to February 2024, 62 nursing trainees were selected from our institution. A randomized controlled trial design was employed, with students randomly assigned to either the study group or the control group, each comprising 31 female students. The average age of students in the study group was 18–20 years old, with a mean age of  $19.42 \pm 0.51$  years; while in the control group, students aged 19–20 years old, with a mean age of  $19.53 \pm 0.46$  years. There were no significant differences in baseline characteristics between the two groups ( $P > 0.05$ ).

Inclusion criteria: All students were informed about the study content and collaborated in completing the research.

Exclusion criteria: Students were excluded if personal factors prevented their participation in the study.

### **2.2. Methods**

The control group underwent conventional practical training. Teachers formulated teaching plans in advance, specifying key and challenging aspects of the curriculum. They demonstrated various nursing procedures, providing detailed explanations of each operational step and highlighting key points. Teachers also addressed the complexities of nursing procedures through demonstrations. Following the explanations, students replicated the procedures under supervision. Teachers observed student performance, corrected errors promptly, and concluded each session with a classroom summary.

The study group adopted a flipped classroom practical training model based on the outcome-oriented educational concept. The specific teaching methods are as follows:

- (1) Formation of a nursing training team: Our institution formed a nursing training team consisting of theoretical course instructors and practical training teachers. The theoretical course instructors were primarily responsible for developing flipped classroom practical training programs based on the outcome-oriented educational concept and providing technical support for practical training. The practical training teachers were responsible for implementing the teaching programs.
- (2) Development of teaching plans: Team members analyzed past issues in nursing practical training, reviewed relevant literature, consulted experts in the field of nursing training, and formulated comprehensive teaching plans to address identified challenges.
- (3) Implementation of teaching: (a) Clarification of teaching objectives: In the first nursing practical training session, teachers explained the nursing training objectives and learning requirements based

on the textbook content and curriculum outline. (b) Teacher demonstration: During practical training, teachers demonstrated various nursing procedures, explaining the key points and precautions for each step and highlighting the critical and challenging aspects of nursing procedures. (c) Student internalization and absorption: After the teacher’s demonstration, students engaged in practice exercises. Teachers provided guidance, promptly correcting any errors made by students. Students were required to repeatedly practice independently in class, clearly defining the focal points and challenging aspects of nursing procedures, and summarizing their nursing operation experiences. (d) Flipped classroom discussion: Teachers divided students into several small groups. Each group demonstrated nursing procedures within their groups and discussed the difficulties, key points, and areas of misunderstanding. (e) Classroom summary: After group demonstrations, each group designated a representative to demonstrate nursing procedures. Teachers and other students provided feedback on the nursing procedures. Finally, the teacher summarized the class, explaining the standards for nursing procedures and emphasizing the key points and challenging aspects of each operation step to deepen students’ understanding and memory.

### 2.3. Evaluation criteria

The assessment criteria included comparing the assessment scores and teaching satisfaction of students from both groups. The self-directed learning ability of students was evaluated using a self-directed learning ability assessment scale.

### 2.4. Statistical methods

Research data were analyzed using SPSS23.0 software. For continuous data (mean  $\pm$  standard deviation [SD]), *t*-tests were conducted, while for categorical data (%), chi-square tests were used. A significance level of  $P < 0.05$  indicated statistical differences between groups.

## 3. Results

### 3.1. Comparison of assessment scores and teaching satisfaction between the two groups

Data in **Table 1** shows that the study group had significantly higher assessment scores and teaching satisfaction compared to the control group ( $P < 0.05$ ).

**Table 1.** Assessment scores and teaching satisfaction of the two groups

Groups	Assessment scores	Teaching satisfaction
Study group ( $n = 31$ )	91.29 $\pm$ 3.85	30 (96.8%)
Control group ( $n = 31$ )	84.07 $\pm$ 1.96	25 (80.6%)
<i>t</i>	9.305	4.026
<i>P</i>	0.000	0.044

### 3.2. Comparison of self-directed learning ability scores between the two groups

Data in **Table 2** shows that the study group’s self-directed learning ability scores were significantly higher than those of the control group ( $P < 0.05$ ).

**Table 2.** Self-directed learning ability scores of the two groups (mean  $\pm$  SD)

Groups	Collaborative learning	Information literacy	Self-management	Total scores
Study group ( $n = 31$ )	38.29 $\pm$ 4.71	46.85 $\pm$ 4.93	31.04 $\pm$ 4.58	119.07 $\pm$ 5.83
Control group ( $n = 31$ )	35.04 $\pm$ 3.81	42.26 $\pm$ 2.81	27.19 $\pm$ 2.96	102.35 $\pm$ 4.16
<i>t</i>	2.987	4.504	3.931	12.998
<i>P</i>	0.004	0.000	0.000	0.000

## 4. Discussion

The quality of nursing practical training can significantly influence students' practical skills and their ability to integrate theory with practice. To achieve this, it is essential to optimize and adjust the teaching mode based on the actual characteristics of students. This optimization helps students become proficient in various nursing procedures, learn to collaborate with others, and develop a strong professional ethical standard<sup>[6,7]</sup>.

In this study, statistical comparisons showed that students in the study group had significantly higher assessment scores and greater satisfaction with teaching compared to the control group. This suggests that the flipped classroom model based on outcome-oriented educational principles can enhance nursing practical training outcomes and increase teaching satisfaction. Conventional nursing practical training typically relies on teacher-led demonstrations, where students passively observe and imitate nursing procedures demonstrated by the teacher. This method often concludes with a comprehensive summary by the teacher, limiting student opportunities for hands-on practice and interactive engagement, thereby reducing teaching satisfaction among some students<sup>[8,9]</sup>. In contrast, the flipped classroom model based on outcome-oriented educational principles involves teachers analyzing and summarizing nursing practical training experiences, consulting expert guidance, and defining desired educational outcomes<sup>[10,11]</sup>. During flipped classroom sessions, in addition to conventional demonstrations, teachers organize cooperative group learning activities. Students are required to independently complete nursing procedures based on teacher demonstrations, analyze key points and challenges, and engage in multiple iterations of independent exploration. This approach enables students to master operational techniques effectively, engage in meaningful interactions with teachers, and significantly improve assessment scores and teaching satisfaction<sup>[12,13]</sup>. Statistical comparisons in this study showed that students in the study group scored significantly higher in self-directed learning abilities compared to the control group, indicating that the flipped classroom model based on outcome-oriented educational principles can enhance students' self-directed learning capabilities. Compared to conventional nursing practical training programs, the flipped classroom model places students at the center of the learning process. Instead of passively imitating teachers, students engage in cooperative group learning, autonomously explore the key points and challenges of nursing procedures, and solve problems encountered during operations. Teachers provide guidance and support, fostering continuous and effective self-directed learning that significantly enhances students' capabilities for independent learning and prepares them well for future nursing practice<sup>[14,15]</sup>.

## 5. Conclusion

In conclusion, adopting the flipped classroom model based on outcome-oriented educational principles in vocational nursing practical training can improve students' assessment scores and self-directed learning abilities, as well as increase teaching satisfaction. This approach holds significant value for broader application and implementation in educational settings.

## Disclosure statement

The authors declare no conflict of interest.

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