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Application of hybrid teaching method in the teaching of morphology in higher vocational nursing

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Abstract: This study aims to explore the effectiveness of applying the hybrid teaching method in the course Normal Human Morphology and Structure for higher vocational nursing students. The method applied in this paper is ten classes of 2024 higher vocational nursing in a school were divided into two groups by random number method. The control group adopted the traditional teaching method based on cloud classroom, and the research group adopted the hybrid teaching method based on cloud classroom, which integrated flipped classroom, split classroom, case teaching method and Sandwich teaching method. After the teaching of this subject, the scores of students' grades, teaching quality satisfaction and students' autonomous learning ability in the two groups were compared and analyzed. The results are the total score of the research group was higher than that of the control group ($P<0.05$); there was no statistical difference in the satisfaction score of the two groups in the basic skills of teaching ($P>0.05$), but the satisfaction score of the research group in the three aspects of teaching content, teaching methods and ability training was higher than that of the control group ($P<0.05$); the scores of other dimensions of the autonomous learning ability score of the research group except "self-monitoring and regulation" were higher than those of the control group ($P<0.05$). Hybrid teaching method can improve the teaching quality of higher vocational nursing morphology.

1. Introduction

Normal Human Morphology and Structure is an organic integration of three morphology courses: human anatomy, histology, and embryology. As a basic teaching, higher vocational nursing students start learning it in the first semester of enrollment. It is characterized by abstractness and complexity [1]. Nursing students are prone to lack of interest in learning, and learning effects are difficult to guarantee, which then becomes a difficulty in teaching. In recent years, with the widespread application of the Internet, cloud classrooms in teaching have gradually grown in scale. Since 2017, our college has enriched the teaching form and content in morphology teaching with the help of the "University Town Cloud Classroom Platform" [2], but teaching practice has found that students are not serious and attentive in online learning, and even play teaching videos but do

not watch them at all. They do not actively think or participate in discussions in offline classes; some teachers also have problems with insufficient teaching preparation [3], or simply display the collected teaching materials in class without truly integrating them into teaching [4]. Therefore, starting from 2021, we will explore the hybrid teaching method based on cloud classrooms in the teaching of Normal Human Morphology and Structure in higher vocational nursing, in order to improve its teaching effect by learning from the strengths of various teaching methods. It is briefly described below for reference by colleagues.

2. Research subjects and methods

2.1. Teaching subjects

The cluster sampling method was adopted, and 443 students from 10 classes of the 2024 higher vocational nursing of our hospital were the research subjects. The 10 classes were numbered and randomly divided into a control group (232 people) and a study group (211 people) by random number method. The distribution of baseline data of the two groups was as follows: gender: 69 boys and 163 girls in the control group, 55 boys and 156 girls in the study group; age: (19.66±0.62) years old in the control group, (19.54±0.81) years old in the study group, and admission scores: (272.33±42.81) points in the control group and (273.55±45.12) points in the study group. There was no statistical difference in the baseline data of the two groups of students (gender: χ^2 =0.740, P =0.390; age: t =1.750, P =0.085; admission score: t =0.291, P =0.771), so the two groups were comparable.

2.2. Methods

The two groups of students used the same textbook, Normal Human Morphology and Structure edited by Kong Lingping et al. , and formulated unified teaching objectives, teaching hours and assessment content according to the teaching syllabus. The control group enriched the teaching content with the help of the cloud classroom platform on the basis of traditional teaching, while the research group adopted a hybrid teaching method based on the cloud classroom. This model integrates flipped classroom, split classroom, case-based learning (CBL), Sandwich teaching method and other teaching methods before, during and after class, realizing the overall and systematic teaching of “pre-class preparation, overview, internalization, discussion and summary of the content during class, and review after class”.

2.2.1. Before class

The teacher issues preview tasks to students through the cloud classroom - ask 2 to 3 questions in the form of cases, and guide students to watch relevant learning materials with these questions.

2.2.2. During class

The class time is divided into two parts: the teacher’s lecture and the discussion between teachers and students. The teacher can arrange the time allocation for the two parts through the teaching plan. (1) Lecture: The teacher will talk about the main content (framework form), key points and difficult points of this lesson. This process is based on the textbook and supported by the teaching PPT. The pre-class preparation tasks are used as a supplement to help students build a complete knowledge system, guide students to grasp the learning content, and help them understand and remember the key points and difficult points. (2) Knowledge absorption: It takes about 5 minutes for students to

quickly draw a simple content of this chapter (in the form of a mind map). After the drawing is completed, the teacher selects a student's mind map through the digital random method, and the teacher takes the lead to discuss the advantages and disadvantages of the mind map with the students to further deepen the students' knowledge memory. (3) Discussion: The discussion is divided into three parts: the teacher tests the students, the students test the students, and the students test the teachers. ① Teacher tests the students: The teacher designs a scenario based on the nursing clinical practice case and asks 4 to 7 questions. The number of questions is the same as the number of class groups, and each group has one question. After receiving the questions, students study and discuss in groups, brainstorm and integrate answers, and randomly select group members (decided by students drawing lots or rock-paper-scissors) to answer the questions. The teacher gives comments based on the answers. ② Students test students: Still in groups, each group asks a question on its own and selects other groups to answer by drawing lots. The commentator is a representative of the questioning group. ③ Students test teachers: In groups, each group asks questions to the teacher, and the teacher answers the students' questions, and discusses and analyzes the questions and answers. (4) Teacher summary and comments: The teacher comments on the "test and answer" of each group, mainly with positive encouragement, and reviews and reviews the knowledge points of this class to achieve the integration of knowledge.

2.2.3. After class

Based on the teaching syllabus and lesson plan, instructors design contextualized scenarios related to the content of the current chapter—particularly focusing on key and difficult concepts—by integrating real clinical cases. These post-class assignments are published on platforms such as the "Case Analysis Platform" and the "Learning Assessment Platform." Students can review and reinforce the key knowledge points through the Cloud Classroom.

2.2.4. Evaluation indicators

The evaluation indicators include student performance, teaching quality satisfaction, and student autonomous learning ability. (1) Student performance: Student performance is composed of three parts: homework, periodic examinations, and final examinations, which account for 10%, 20%, and 70% of the total score respectively [5], with a full score of 100. (2) Teaching quality satisfaction score: Reference [6] made a self-made teaching quality satisfaction questionnaire, which has 4 dimensions (15 questions) in total, and the score is proportional to the satisfaction. Cronbach's scale α value is 0.845. (3) Autonomous learning ability: a total of 34 items with 4 dimensions, using the Likert 5-point rating method [7], with ability proportional to the score. The above two questionnaires were anonymously surveyed to students after the end of the course this semester, and the statistical data were entered into an Excel document by two people.

2.2.5. Statistical methods

SPSS 23.0 was used for statistical analysis. First, a normal distribution test was performed, and the chi-square test or test was used if it met the requirements. The results were considered statistically significant when $P < 0.05$.

3. Results

3.1. Grades

There was no statistical difference in the scores of homework between the two groups (P >0.05), but the scores of the research group in the interim examinations and final examinations were higher than those in the control group, and the total score was also higher than that in the control group (P <0.05). See Table 1 for details.

Table 1: Anatomy results of the two groups (x±s , points)

Group	Homework	Periodic examination	Final Exam	Overall score
Control group (n=232)	82.49±7.56	78.96±8.30	72.92±10.22	73.88±9.25
Study group (n=211)	83.09±8.14	82.89±8.34	75.49±9.20	76.25±8.64
t	-0.803	-4.972	-2.772	-2.784
P	0.423	0.004	0.006	0.006

3.2. Teaching Satisfaction Evaluation Results

There was no statistical difference in the scores of “Basic Teaching Skills” between the two groups (P>0.05), and the scores of the other three aspects including teaching content, teaching methods, and ability training were significantly higher in the research group than in the control group (P<0.05). See Table 2 for details.

Table 2: Teaching satisfaction rating results (x±s , points)

Group	Course content	Teaching Methods	Capacity Building	Teaching Basics
Control group (n=232)	14.90±2.75	15.16±2.99	10.89±2.32	15.81±3.22
Study group (n=211)	15.96±3.16	16.18±3.18	11.87±2.52	15.90±3.47
t	-3.779	-3.471	-4.258	-0.298
P	<0.001	0.001	<0.001	0.766

3.3. Autonomous learning ability

The autonomous learning ability scores of the research group were significantly higher than those of the control group in terms of scores in other dimensions except “self-monitoring and regulation” and the total score (P < 0.05).See Table 3 for details.

Table 3: Scoring results of autonomous learning ability of the two groups (x±s , points)

Group		Control group (n=232)	Study group (n=211)	t	P
Self-learning ability rating	Self-motivational beliefs	49.57±7.51	53.27±6.86	-5.383	<0.001
	Task Analysis	20.82±3.83	21.71±3.67	-2.476	0.014
	Self-monitoring and regulation	34.96±5.31	34.76±4.17	0.458	0.647
	Self-evaluation	13.83±2.76	14.83±2.85	-3.739	<0.001
	Total score	119.20±15.97	124.56±12.70	-3.931	<0.001

4. Discussions

4.1. Scientificity of hybrid teaching method based on cloud classroom

The background of hybrid teaching method is that a single teaching method has certain shortcomings. The effective integration of multiple methods can make up for the limitations of each method while giving full play to its advantages [8] . Taking the flipped classroom as an example, in the teaching of “Normal Human Morphology and Structure”, in order to improve students' spatial imagination, students need to spend more time watching related pictures, animations, and videos. However, the time in class is limited, and the setting of the flipped classroom can solve this shortcoming. However, if the flipped classroom is to achieve a better teaching effect, it must be based on the students' high ability of independent learning. However, higher vocational nursing students are relatively lacking in this aspect and need to be guided. Introducing CBL during pre-class preparation , by designing a case that nursing students are interested in, guiding students to actively learn and think, so that nursing students feel that the knowledge points are not so unfamiliar, reducing their fear of difficulty and increasing their interest. At the same time, it has an attractive effect. Through general lectures, internalization, discussion and summary in class, questions are answered and doubts are solved, and more abundant knowledge is obtained. Introducing CBL [9] after class can not only test the nursing students' mastery of knowledge points, but also urge them to strengthen their review. In addition, the teaching characteristics of split classrooms are “teacher-led, student-centered”, which divides the class into three parts: teaching, internalization and discussion. The characteristics of the Sandwich teaching method are “learning-practice-learning”, which alternates learning and practice. The above two methods are often combined with CBL[10] , which can significantly reduce the boringness of morphological teaching and improve the understanding and memory of key points and difficult points in morphological teaching [11]. Both of the above methods require class time, and students may not have time to watch animations and videos, so flipped classrooms make up for it.

4.2. Practicality of hybrid teaching method based on cloud classroom

Compared with traditional teaching method based on cloud classroom, hybrid teaching method enriches the roles of teachers and students. For teachers: it has both the teaching role of teachers, ensuring the comprehensiveness and systematicness of knowledge; and the guidance and summary role of teachers, maintaining the integrity of teaching. For students: it has the dual roles of “learning” and “teaching” [13], which increases the interest of learning and the subjective initiative of learning; at the same time, it increases the teaching platform and teaching form, which alleviates the difficulty of teaching “normal human morphology and structure” which is boring and difficult to understand and remember; at the same time, by designing real cases, it promotes nursing students to improve their bad view of “only mastering the superficial knowledge” of human morphology and structure, and deeply implements the teaching objectives of “normal human morphology and structure”. From the research results, it can be seen that their grades have been improved and their teaching satisfaction has been increased, which is consistent with the results of relevant literature [14].

4.3. Shortcomings and Prospects

In the process of implementing this hybrid teaching method, there were also shortcomings. For example, in the early stage of teaching, the discussion time was not well controlled, resulting in insufficient classroom teaching time, and then the discussion had to be moved to the cloud

classroom. In the later teaching process, the teacher strictly controlled the discussion time. But in general, the hybrid teaching method is applied to the teaching of “Normal Human Morphology and Structure” in higher vocational nursing, which not only caters to the current background of “Internet everywhere”, but also reduces the boring, dogmatic and far away from clinical nursing in nursing teaching. At the same time, it improves the autonomous learning of nursing students in learning and increases students' satisfaction with teachers. Although there are shortcomings, I believe that after continuously optimizing the teaching details, a path suitable for the teaching of “Normal Human Morphology and Structure” in higher vocational nursing can be explored.

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