

Exploration of Hybrid Teaching Mode Based on “Byod Joint Task-Driven Learning” in “Pathophysiology”

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Abstract: Objective To study the teaching effect of the hybrid teaching model of “BYOD joint task-driven learning” in “Pathophysiology”. Methods from September 2017 to June 2020, two separate classes of A and B students majoring in rehabilitation therapy technology (massage) and learning pathophysiology in Zhejiang Vocational College of Special Education were selected as the experimental group and the control group. The control group adopts the traditional teaching mode, and the experimental group adopts the hybrid teaching model of “BYOD joint task-driven learning”, compared the teaching effects of the two groups. Result: Compared with the traditional teaching model, the number of outstanding students, student performance, and satisfaction with the teaching effect using the hybrid teaching model of “BYOD joint task-driven learning” were significantly improved ($P < 0.05$). Conclusion: The hybrid teaching model based on “BYOD joint task-driven learning” significantly improves the teaching effect of pathophysiology.

1. Introduction

Pathophysiology is one of the core courses of clinical medicine. It is a discipline that studies the laws and mechanisms of functional and metabolic changes during the occurrence and development of diseases. Its main task is to reveal the nature of diseases and provide theoretical basis for clinical diagnosis and treatment. It is a “bridge” discipline that connects basic medical theory and clinical practice [1,2]. Pathophysiology is highly theoretical, the content of knowledge is abstract, and the pathogenesis is complex. The content of the course not only relies on the knowledge of basic medical disciplines such as physiology and biochemistry, but also involves various clinical problems that students have not yet encountered. Most students think it is relatively abstract and difficult to understand, boring and difficult to learn, easy to forget [2,3]. BYOD (bring-your-own-device) usually means that employees use personal mobile devices to complete work-related tasks [4]. With the advancement and development of technology, BYOD is more and more widely used in all walks of life. The teaching field has also been widely used. In the teaching field, it means that students bring their own mobile devices such as mobile phones or tablet computers to learn. BYOD has become one of the trends in the development of education informatization in the world, and has an important impact on education informatization [5]. Task-based learning is a student-oriented teaching method and concept. It originated in Western language teaching in the 1960s. It advocates the completion of meaningful tasks to achieve the goal of learning knowledge and skills. [6], is a teaching method based on constructivist teaching theory, designing learning objectives into multiple specific tasks, task-driven, teacher-led, and student-oriented exploratory teaching method [7] In recent years, this method has been gradually applied to medical student education [8]. This research aims to improve the teaching quality of pathophysiology, adopting the hybrid teaching mode of “BYOD + task-driven method”, discussing its teaching effect in pathophysiology, and providing reference for the improvement of traditional education methods in colleges and universities.

2. Objects and Methods

2.1 Objects

Selected students from two separate classes in Zhejiang Special Education Vocational College

from September 2017 to June 2020 in rehabilitation therapy technology (Tuina direction) and studying pathophysiology as the research objects. All the research subjects are the unified enrollment of college entrance examination, of which 125 students in Class A are set as the experimental group and 123 students in Class B are set as the control group. The teaching materials of the two groups of students are the same, and the content of the examination is the same. There was no significant difference between the two groups of students in terms of gender ratio, age composition, and average scores of the last semester final exams (all $P>0.05$), and they were comparable. See Table 1 for details. All the subjects in the experimental group used smartphones and WeChat. All subjects in this study are >18 years old, and the informed consent of all subjects has been obtained.

Table 1 Comparison of The Basic Situation of the Research Objects

Gr	gender		Average Age(Y)	Average Score(Points)
	M	F		
Test Gr	52	73	22.68±1.642	77.54±8.970
Control Gr	48	75	22.62±1.588	77.83±9.051
χ^2/t	0.171		0.292	-0.253
P	0.679		0.770	0.800

2.2 Method

The teaching method of the control group According to the teaching requirements of pathophysiology, the total teaching hours are 51 class hours. The traditional teaching mode is adopted, and the students self-prepared before the class. The teacher transmits the knowledge to the students through the classroom teaching theoretical knowledge and multimedia software demonstration. The students complete the learning and application of the knowledge in the teacher's explanation and practice, and the students complete the post-class by themselves Learn.

The teaching method of the experimental group According to the teaching requirements of pathophysiology, the total teaching time is 51 class hours. Adopting the hybrid teaching model of "BYOD + task-driven method", a teaching group consisting of 4 teachers with dual-teacher quality with medical industry background, through preliminary investigation and analysis of the BYOD teaching model in higher vocational colleges and its application in pathophysiology The teaching and research group designed a questionnaire based on the course characteristics, combined with existing teaching methods, and worked out a new teaching plan. The main measures are that teachers use BYOD for task design, participate in task progress and Internet teaching, students use BYOD to carry out learning and complete project tasks, and the resource library is mainly used to help teachers and students communicate learning and store resources. The specific implementation steps include: preparation before class, interaction between teachers and students during class, and expansion after class. Pre-class preparation: Form a WeChat group of teachers and students before the start of the course. The pre-class teaching task is for teachers to write a guide plan based on the key and difficult points of the course, upload it to the teacher and student WeChat group, and students pass in the WeChat class group before class Watch teaching resources, consult teaching materials, and conduct questions, discussions, and answers. Classroom interaction between teachers and students in class: students are the mainstay, students carry mobile terminals (mobile phones or computers) according to their own conditions, carry out project-based teaching methods, task-driven methods for teaching, encourage students to ask more questions, discuss, summarize, summarize, and improve the construction of knowledge. Expansion after class: After class, students can complete the online homework test and the feedback test of learning results on the WeChat official account platform.

Evaluation method After the end of the course, the two groups of students will use the same test paper to take the pathophysiology subject test based on the content of the assessment. The test scores are used as the objective indicator of the evaluation and analysis of the teaching effect. Scores less than 60 are scored as fail, and scores less than 60 are scored as 60-69. Pass, 70-79 is medium, 80-89 is good, ≥ 90 is excellent. An unregistered electronic questionnaire survey method

is used to allow students to evaluate the teaching methods of pathophysiology subjects as a subjective index for the evaluation and analysis of teaching effects. The evaluation is made from the following six aspects: whether the teacher is satisfied with the quality of the lecture, whether it is previewed before class, and learning in class Whether the effect is satisfactory, whether to study after class, whether to study independently, and whether the work is heavy, the respondents answered “yes” or “no”, and the number of people was counted. In addition, an anonymous electronic questionnaire was conducted on the experimental group personnel separately. The content of the questionnaire included: 1. Satisfaction with the “BYOD + task-driven method” mixed teaching mode (unsatisfied, general, satisfactory); 2. Application of the “BYOD + task-driven method” mixed Whether there are difficulties in learning the teaching mode; 3. The main difficulties faced (smart device problems, network problems, other problems and specific problems can be filled in and supplemented); 4. What improvement measures and opinions are hoped for.

2.3 Statistical Analysis

Use SPSS 22.0 software for statistical analysis. Quantitative data are expressed as mean \pm standard deviation ($\bar{x} \pm s$), using t test, qualitative data using χ^2 test, and $P < 0.05$ is considered statistically significant.

3. Results

3.1 Analysis of the Results of the Examination Results of the Two Groups of Students

Compared with the control group, the number of outstanding students in the experimental group was significantly increased, and the average score was significantly higher. The difference was statistically significant ($P < 0.05$).

Table 2 Comparison of Test Scores between the Two Groups of Students

Gr	NG	Pass	medium	good	excellent	Average Score
Test Gr	2	13	46	43	21*	80.58 \pm 8.527*
Control Gr	4	19	56	37	7	77.91 \pm 8.610

3.2 Two Groups of Students' Evaluation of Teaching Effect

A total of 246 people participated in the questionnaire survey. The experimental group participated in 125 people, with a participation rate of 100%, and the control group participated in 121 people, with a participation rate of 98.37%. Compared with the control group, without significantly increasing the degree of tedious work, the experimental group's students' satisfaction with the teaching effect was significantly improved ($P < 0.05$), as shown in Table 3.

Table 3 Comparison of Evaluations of Two Groups of Students on Teaching Methods (Example)

Gr	Lecture quality	Preview before class	Learning in class	After class study	Self-learning	Heavy schoolwork
Test Gr	108(86.4%)	93(74.4%)	102(81.6%)	97(77.6%)	76(60.8%)	36(28.8%)
Control Gr	92(76.03%)	62(51.24%)	85(70.25%)	72(59.50%)	52(42.98%)	27(22.31%)
χ^2	4.347	14.150	4.346	9.363	7.827	1.358
P 值	0.037	<0.001	0.037	0.002	0.005	0.244

3.3 Frequently Asked Questions for Students in the Experimental Group

A total of 125 people participated in the questionnaire survey, with a participation rate of 100%. See Table 4 for specific questions. The meaningful improvement measures and opinions put forward are mainly: 1. The school has wireless network coverage to improve the convenience of online learning; 2. Improve the teaching equipment to make the teaching process more smooth.

Table 4 Investigation of Students' Learning Situation in Experimental Group (Example)

Gr	Person(%)
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Teaching Model satisfaction level	Dissatisfied	11(8.8)
	general	16(12.8)
	satisfaction	98(78.4)
Whether to learn facing difficulty	Y	39(31.2)
	N	86(68.8)
Main difficulty(n=39)	Mobile phones and computers are old and affect learning	14(35.90)
	Network latency affects learning	31(79.49)
	Not adapting to the new teaching model	10(25.64)
	Others	5(12.8)

4. Discussion

Compared with the traditional teaching mode, the BYOD classroom teaching mode adds students' own devices. Students can access the Internet through their own devices and obtain a large amount of learning materials. This broadens the channels for students to obtain information and provides students with a comprehensive range of information. Learning environment [9]. The biggest advantage of BYOD is that it makes full use of individual fragmented time, can learn independently anytime and anywhere, and improve the flexibility, enthusiasm and efficiency of learning [10]. BYOD's classroom teaching model not only retains the essence of the traditional teaching model, but also combines the interactive advantages of discussion-based classrooms, and at the same time conforms to the trend of educational informationization, and is an innovative teaching model [11]. The task-driven method is a teaching method based on constructivist learning theory. It requires the goal of tasks and the creation of teaching situations, so that students can learn through exploration with real tasks, and use traditional teaching based on traditional knowledge. The concept is transformed into a multi-dimensional interactive teaching concept focusing on solving problems and completing tasks, so that students are in an active learning state, based on their own understanding of current problems, using shared knowledge and their own unique experience to propose solutions and solve problems [12].

The traditional teaching mode adopts the teaching method of "full classroom" and "injection". The teacher transmits knowledge to students through classroom lectures. Students complete the learning and application of knowledge in the teacher's explanation and practice. The students are passive in the whole teaching process. To accept the knowledge of learning is a teacher-centered cramming teaching model [13]. The hybrid teaching model of "BYOD + task-driven approach" takes students as the main body, diversified learning resources on the teaching platform, effective interaction throughout the teaching process, and timely feedback, which has changed the shortcomings of the traditional teaching model. Our school adopts the hybrid teaching mode of "BYOD+task-driven method" to realize students' "memory" and "understanding" of knowledge through pre-class preparation, and the interaction between teachers and students in class realizes the application and analysis of knowledge, and the expansion after class is based on time, The space has created conditions for students, which greatly improves learning efficiency and effectively utilizes teaching resources. At the same time, this teaching mode can obtain feedback from students on problems, and students can easily reflect on their own knowledge level, check deficiencies and make up for omissions, and teachers can also solve students' questions in a more comprehensive and targeted manner in the learning process. Improving classroom teaching efficiency also improves students' participation in teaching activities, learning interest and autonomous learning ability [11].

There are still challenges in the implementation of the hybrid teaching model of "BYOD + task-driven approach". This teaching model has high requirements for school facilities such as multimedia classrooms, wireless networks, and teachers and students' own equipment. Students have long been Accepting the passive learning form of the traditional teaching mode, it is difficult to adapt to the new hybrid teaching mode for a while [10]. Although bringing your own equipment into the classroom is conducive to the improvement of teaching effects, the entertainment function of the mobile phone itself will interfere with students' learning, which not only requires teachers to strengthen management, but also requires students to have higher self-discipline [14]. Secondly, the

hybrid teaching mode of “BYOD + task-driven method” has higher requirements for teachers. As task makers, teaching process designers, teaching organizers, and students’ instructors, teachers should add the theoretical knowledge of the teaching mode. To learn, reasonably select teaching content, clarify goals and tasks, and strictly design the teaching process, teachers should change their roles to truly realize the student-centered teaching purpose [15].

In this study, the number of outstanding students and student performance in the hybrid teaching model of “BYOD + task-driven approach” were significantly higher than that of the traditional teaching model ($P < 0.05$); under the condition of not significantly increasing the degree of tedious work, students were The satisfaction of teaching effect is significantly improved compared with the traditional teaching mode ($P < 0.05$). In summary, the hybrid teaching model based on “BYOD + task-driven approach” significantly improves the teaching effect of pathophysiology.

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