

Application of Flipped Classroom in Vocational Medical Education Research

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Abstract: With the rapid development of information technology, the field of education is constantly exploring innovative teaching methods. Flipped classroom, as a method to disrupt traditional teaching models, has gradually attracted attention in the teaching of medical majors in higher vocational education. This study aims to explore the application of flipped classrooms in the teaching of medical majors in higher vocational education and analyze its impact on students' academic performance and practical abilities, with the hope of providing strong theoretical support for the teaching reform in medical majors.

1. Introduction

With the development of society and the continuous updating of knowledge in the medical field, medical majors in higher vocational education face increasingly severe teaching challenges. Traditional teaching models often place the teacher at the center, and students passively receive knowledge, making it difficult to meet the requirements of modern medical professions for practical skills and comprehensive qualities. Therefore, finding a more effective teaching model to promote students' active learning and the cultivation of practical abilities becomes urgent. Flipped classroom, as an innovative teaching method, provides new possibilities for addressing this issue.

Currently, there are significant issues in the traditional teaching models of medical majors. Firstly, the vast and constantly updated medical knowledge makes it challenging for students to fully understand and grasp through traditional lectures. Secondly, traditional teaching methods emphasize the imparting of theoretical knowledge and neglect the cultivation of students' practical abilities. In actual clinical work, having theoretical knowledge alone is far from sufficient; practical skills and teamwork are more critical. Therefore, innovating in medical major teaching to stimulate students' proactive learning and practical abilities is an urgent issue that needs to be addressed.

Flipped classroom changes the traditional teaching sequence by moving students' learning activities from the classroom to before the class, utilizing class time for problem-solving, practice, and discussions. This teaching model aligns with constructivist theory, emphasizing students' active construction of knowledge, contributing to the development of critical thinking and problem-solving skills. For medical majors, the advantage of flipped classrooms lies in the ability to guide students in-depth learning of medical knowledge in advance, while using class time for simulating clinical scenarios, prompting students to apply knowledge in a more realistic environment, thereby enhancing practical abilities.

2. The Theoretical Foundation of Flipped Classroom

The theoretical foundation of flipped classrooms includes cognitive theory, constructivist theory, and socio-cultural theory. Through the analysis of these theories, we can better understand why flipped classrooms may be successful in the teaching of medical majors.

2.1 Cognitive Theory

Cognitive theory emphasizes individuals' active participation and information processing in the learning process. Flipped classrooms, by providing pre-learning materials, enable students to independently grasp basic knowledge before class, emphasizing students' processing and understanding of information. In traditional teaching, students receive information in the classroom, while in flipped classrooms, students need to acquire information before class through reading, videos, etc., enhancing their information processing and analytical abilities. This aligns with the emphasis in cognitive theory on individuals actively acquiring knowledge.

2.2 Constructivist Theory

Constructivist theory posits that learning is an active process of constructing knowledge, emphasizing learners building understanding and knowledge systems through interaction with the environment. In flipped classrooms, students engage in independent learning before class through learning resources, and in the classroom, they engage in knowledge construction through discussions and collaboration with classmates and teachers. This aligns with the core idea in constructivist theory that learning occurs through social interaction and collaborative knowledge-building, prompting students to understand and consolidate knowledge through interaction[1].

2.3 Socio-cultural Theory

Socio-cultural theory views learning as a social activity within a socio-cultural environment. In flipped classrooms, students participate in a social process of co-constructing knowledge through pre-class learning and collaborative practices in the classroom. Additionally, through tools such as social media, students can engage more widely in academic and practical communities in the medical field, communicate with professionals, and form a broader social learning experience. This aligns with the socio-cultural theory's emphasis on learning taking place in a social environment.

2.4 Integration of Flipped

Classroom with Theoretical Foundations Flipped classrooms integrate cognitive theory, constructivist theory, and socio-cultural theory, forming an organic teaching model. In flipped classrooms, students are not just passive recipients of information; they are also knowledge constructors. Through individual learning and social cooperation, students deepen their understanding of knowledge. This not only cultivates students' ability for independent learning and critical thinking but also enhances their participation in the socio-cultural environment, better preparing them for the complex challenges in the field of medicine. Therefore, flipped classrooms in the teaching of medical majors in higher vocational education possess theoretical scientificity and practical innovation.

3. Implementation of Flipped Classroom in Medical Majors in Higher Vocational Education

3.1 Preparation of Pre-class Learning Resources

In higher vocational medical education, the implementation of flipped classrooms begins with the preparation of pre-class learning resources. Teachers can utilize online platforms, educational software, etc., to provide diverse learning resources, including video lectures, textbook chapters, academic papers, etc. These resources should cover key knowledge points of the current learning unit to stimulate students' interest and initiative in learning.

3.2 Design of Pre-class Learning Tasks

The design of each learning unit should clearly define learning objectives and be accompanied by specific learning tasks. This may include reading assigned articles, watching relevant videos, solving problems, or preparing for group discussions. The design of tasks should encourage students to think deeply and engage in independent learning, laying the foundation for higher-level activities in the classroom.

3.3 Classroom Interaction and Practical Activities

In the classroom, emphasis on interaction and practical activities is crucial. Here are some implementation methods:

Group discussions and collaborative projects: Students are divided into groups to discuss and solve real medical problems, fostering teamwork and communication skills. Experiments and clinical simulations: Utilize laboratories and simulate clinical scenarios, allowing students to engage in practical operations and simulate case handling, enhancing practical skills. Problem-solving and case analysis: Provide medical cases, guide students to analyze and propose solutions, cultivating problem-solving and judgment abilities. Subject lectures and professional sharing: Invite professionals to give lectures or share practical experiences, helping students better understand the forefront of the profession and actual work.

3.4 Consolidation and Extension after Class

After class, students need to engage in consolidative learning and extended thinking. Teachers can assign homework, provide additional learning resources, or encourage students to engage in practical activities to consolidate and expand on what they learned in class. This helps deepen students' understanding and application of knowledge.

3.5 Teaching Evaluation and Feedback

Regular teaching evaluations and timely feedback are crucial components of flipped classrooms. Through methods such as group discussions, assignment assessments, practical operation evaluations, teachers can understand students' academic performance and practical abilities. Meanwhile, providing targeted feedback helps students correct errors and further improve their abilities[2].

3.6 Application of Educational Technology Tools

The use of educational technology tools, such as online learning platforms, virtual experiment software, etc., can better support the implementation of flipped classrooms. These tools provide

more flexible learning resources and interactivity, allowing students to learn anytime, anywhere, and facilitating seamless connections between in-class and out-of-class activities.

Through the above implementation methods, flipped classrooms in medical majors in higher vocational education can better cultivate students' practical operation skills, teamwork spirit, and critical thinking, enabling them to better adapt to the challenges of the future medical field.

4. The Role of Flipped Classroom in Teaching Medical Majors in Higher Vocational Education

4.1 Impact of Flipped Classroom on Students' Medical Learning Performance

The impact of flipped classrooms on students' medical learning performance is multifaceted, involving academic grades, depth of understanding, learning motivation, and practical abilities.

Flipped classrooms emphasize that students independently learn relevant knowledge before class, and class time is used for problem-solving, discussions, and practice. This learning model helps students have a deeper understanding of course content, resolve confusion in advance, and perform better in exams. Flipped classrooms encourage students to establish foundations through independent learning before class, leading to in-depth discussions and practices during class. This prompts students not only to passively receive information but to actively learn and interact, fostering critical thinking and a deep understanding of medical knowledge. Because students can engage more deeply in discussions and practices during class, their learning motivation tends to be higher. Through direct participation, students can better perceive the practical value of learning, stimulate interest in the medical field, and increase enthusiasm for the subject. Flipped classrooms emphasize practical activities in class, such as simulations, solving real cases, etc. This practical learning helps students better transform theoretical knowledge into practical skills, enhancing their adaptability in clinical environments. Group discussions and collaborative projects in flipped classrooms help cultivate students' teamwork and communication skills. The medical field often requires interdisciplinary collaboration, and interactive learning in flipped classrooms makes it easier for students to adapt to future teamwork. The learning model of flipped classrooms emphasizes students' independent learning, cultivating their ability to actively acquire knowledge. This is especially important for students in medical majors because the medical field's knowledge is updated rapidly, requiring students to develop habits of independent learning[3].

In summary, flipped classrooms positively impact students' medical learning performance by changing the traditional teaching model, making students more engaged and active, thereby improving their overall qualities and practical abilities in the medical profession.

4.2 Cultivation of Practical Abilities by Flipped Classroom

Flipped classrooms have a significant impact on cultivating practical abilities for students in medical majors, as they can engage in practical operations and simulate medical scenarios in class. This practice helps students better understand and apply medical knowledge, enhancing their operational skills and ability to handle real cases in future clinical work. Flipped classrooms emphasize students independently learning relevant knowledge before class, and class time is used for problem-solving and case analysis. This cultivates students' problem-solving abilities, enabling them to flexibly address various diseases and conditions in actual medical practice. Flipped classrooms often include group discussions and collaborative projects, allowing students to solve medical problems through teamwork. This contributes to developing students' cooperation and teamwork abilities, as the medical field often requires multidisciplinary collaboration. In flipped classrooms, practical activities in laboratories or simulation operations are often designed. This

hands-on practice helps students better grasp experimental methods and medical skills, laying a solid foundation for future practical work. Inviting professionals in the medical field to give lectures or conducting field visits provides students with direct exposure to real medical environments. This kind of practice allows students to gain a deeper understanding of professional knowledge and actual working conditions in the medical field. Flipped classrooms frequently encourage students to participate in discussions about solving real problems and designing solutions. This hones students' ability to analyze problems and innovate solutions, making them more independent and capable of critical thinking and judgment in practical situations.

Through these practices, flipped classrooms not only help students master theoretical knowledge but also cultivate their practical abilities through hands-on experience. This is particularly important for students in medical majors as they will need to flexibly apply learned knowledge in real clinical environments and address various practical issues.

5. Application Research of Flipped Classroom in Teaching Medical Majors in Higher Vocational Education

The application research of flipped classrooms in teaching medical majors in higher vocational education aims to better adapt to the demands of modern medical professions for practical skills and comprehensive qualities.

Teachers can provide preview materials through online platforms, educational software, etc., including relevant textbooks, academic articles, experimental videos, etc. Students independently study before class, gaining knowledge through self-directed reading and the use of learning resources, enabling them to understand and grasp relevant medical knowledge in advance. Class time can be used for group discussions and collaborative projects, allowing students to work together to solve real medical problems. This helps cultivate students' teamwork, communication, and problem-solving abilities, simulating a real medical teamwork environment. Real medical cases can be introduced in class, allowing students to analyze problems and conduct case studies. Students collectively think about the case, propose diagnoses, and treatment plans, cultivating their abilities to analyze practical cases and solve problems. Practical activities in the form of laboratory exercises or simulation operations can be designed in flipped classrooms, allowing students to experience and apply medical theory in class. This practical learning helps improve students' practical operational skills, boosting their confidence in laboratory and clinical environments. Medical skills training can be incorporated into flipped classrooms, where students perform actual skill operations in class, such as simulated surgeries, clinical skill rehearsals, etc[4]. This helps students better master and apply medical skills, improving their adaptability in real-world work. Inviting professionals in the medical field to give lectures or conduct field visits provides students with direct exposure to real medical environments, helping them understand industry trends and actual working conditions. Encouraging students to participate in academic discussions and research projects enhances their in-depth understanding and critical thinking in the medical field. Students can engage in medical research through group or individual projects, cultivating their research capabilities.

Through these application methods, flipped classrooms in teaching medical majors in higher vocational education can better meet the needs of cultivating students' practical abilities, helping them better adapt to the challenges of future medical practice[5].

6. Conclusion

Through a comprehensive and in-depth study of the application of flipped classrooms in teaching medical majors in higher vocational education, this research has drawn a series of conclusions and

proposed suggestions for future research directions and teaching practices. It is hoped that these findings will provide useful references and insights for the teaching reform of medical majors in higher vocational education.

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