

Database Application Courses Flipping Classroom Active Teaching Practice

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ABSTRACT

In the process of database knowledge teaching, the flipped classroom has progressively gained widespread recognition among both instructors and students as an innovative teaching approach. This recognition has occurred in conjunction with the growth of the teaching reform in my nation. It is possible for individuals to better assist students in learning from database knowledge by applying this application of teaching approaches. The content of the curriculum is acquired by the students in the flipping class through pre-class activities like as watching educational videos and reading materials. The primary focus of the class time is on interaction between the teacher and the students, problem-solving, and practical exercises. Students are encouraged to take initiative and participate in the learning process through the use of this instructional paradigm, which helps students develop their capacity for autonomous learning and creative thinking. On the other hand, the specific application of classroom teaching has run into equivalent challenges as a result of the existence of some external circumstances. This has occurred during the process of actual teaching. During the process of learning, for instance, pupils do not demonstrate sufficient initiative, and the professors do not position themselves in a manner that is sufficiently evident. Therefore, the purpose of this paper was to investigate the possible applications of flipping classrooms as a method of instruction. In the process of acquiring database knowledge, it is anticipated that the role of teaching models such as flipping classrooms can be better understood through the application of specific exploration methodology.

Keywords: Database system, teaching reform, flipped classroom, teaching approaches, exploration methodology

INTRODUCTION

As a basic course for data storage and management, the database system is not only a compulsory core course for computer majors but also a key elective course for many information and management majors. This course's current teaching generally employs traditional teacher-dominated methods. Most students only passively complete the corresponding learning tasks according to the teacher's instructions. They lack initiative and enthusiasm, and it is difficult to achieve the ideal teaching effect. The teaching process in flipped classroom teaching mode fully highlights the core position of students. With the help of the new teaching model and concept of "student explanation → class discussion → teachers' lectures → followers of counseling," students can effectively promote students' autonomous learning. To strengthen knowledge the effect of absorption and internalization, thereby improving the quality of classroom teaching.

Review of Related Literatures

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teacher-dominated traditional methods. Most students only passively complete the corresponding learning tasks according to the teacher's instructions. They lack initiative and enthusiasm, and it is difficult to achieve the ideal teaching effect. In the teaching process of flipped classroom teaching mode, it fully highlights the core position of students. With the help of the new teaching model and concept of "student explanation → class discussion → teachers' lectures → followers of counseling," students can effectively promote autonomous learning. To strengthen knowledge The effect of absorption and internalization, thereby improving the quality of classroom teaching.

Recent scholarly articles on flipped classroom approaches, specifically in the realm of higher education and courses focused on database applications, emphasize the substantial influence this approach has on student learning results and engagement. The flipped classroom model restructures the conventional lecture-based format by requiring students to interact with instructional material outside of class, usually through video lectures or reading assignments, and utilizing classroom time for interactive activities focused on problem-solving. This methodology enables a dynamic and cooperative learning atmosphere, which has been demonstrated to enhance students' comprehension and recall of course content.

Love et al. (2019) provided evidence that students enrolled in a flipped linear algebra course expressed greater happiness and achieved superior academic results when compared to those in typical classroom environments. The study highlights the significance of in-class activities in improving students' ability to apply concepts, especially in courses that include practical problem-solving, such as database applications (PLOS). Similarly, McLaughlin et al. (2019) discovered that implementing the flipped classroom approach in health profession courses resulted in heightened student engagement and enhanced comprehension of intricate subjects. This study emphasizes the significance of coordinating out-of-class tasks with in-class exercises to optimize the efficiency of the flipped model.

Extensive research has been conducted on the implementation of flipped classrooms in engineering and computing education. Lucke, Keyssner, and Dunn (2020) found that using classroom response systems in a flipped engineering classroom led to a substantial enhancement in both student engagement and understanding. The incorporation of technology in the flipped classroom, including real-time feedback systems, increases the active learning experience by making it more dynamic and adaptable to the needs of students.

Zainuddin and Perera (2020) conducted more research on the psychological components of the flipped classroom. Their study specifically examined how the flipped classroom enhances students' competence, autonomy, and relatedness. According to their research, the flipped classroom paradigm improves academic achievement and has a favorable impact on students' interest and engagement. These aspects are particularly important when learning complicated subjects like as database applications.

Upon evaluating these research, it becomes apparent that the flipped classroom paradigm is more efficacious in subjects that derive advantages from active learning and practical application, such as engineering, computing, and the health sciences. Akçayır and Akçayır (2019) conducted a thorough examination of flipped classrooms, highlighting the benefits and difficulties linked to this instructional approach. According to SpringerLink, the researchers discovered that the flipped model of teaching encourages active learning and improves engagement. However, they also found that for it to be genuinely effective, it requires meticulous organization and a proper balance between activities done outside of class and those done in class.

The research continuously affirms that the flipped classroom is a viable and often preferable alternative to traditional teaching methods. This is particularly true in courses that need extensive student interaction and practical application. These findings indicate that if the

flipped classroom is done carefully, it can result in enhanced academic achievements and a more captivating learning experience for students.

Theoretical Framework

The theoretical framework of the database system course is based on the flipping class

1. Autonomous learning theory: Emphasizes the autonomy and initiative of students in the learning process. To cultivate students' self-learning abilities, flip the classroom mode through autonomous learning and in-depth classroom discussion.

2. Constructionist Learning Theory: Thinking that learning is the process of actively building new knowledge based on existing knowledge and flipping the classroom to encourage students to build their knowledge system through independent inquiry and cooperation learning.

3. Interactive teaching theory: Advocates for an interactive process between teachers and students themselves. The classroom discussion and group activities in the classroom have promoted interaction and knowledge sharing between students.

4. Diversity Intelligence Theory: It is believed that students have a variety of different intelligent types. The flipping class provides diverse learning resources and activities, meets different students' learning needs, and promotes the development of diversified intelligence.

5. Teaching design theory: Pay attention to how to effectively organize teaching content and teaching activities to improve the teaching effect. To ensure the rationality and effectiveness of the teaching, the classroom design must consider the characteristics of the students, the teaching goals, and the teaching environment.

METHODOLOGY

The status of the teaching course on database applications is: (1) Students lack the initiative to learn Database knowledge, which is an important part of computer course learning, has the characteristics of complex knowledge and is difficult to understand. In the traditional teaching model, teachers use classroom theoretical teaching and machine-on-machine methods to teach database knowledge to students. However, in the specific learning process, when faced with complex knowledge, students can easily lose interest in learning. At the same time, students cannot integrate theoretical knowledge with actual operations and often have no way to use the complex database system. In this case, the initiative of students' learning will gradually decline, and they will eventually lose interest in database knowledge learning, which will affect their mastery of their knowledge and skills. (2) Teachers are not clear enough about their own positioning.

In addition to students, teachers themselves will also have unclear positioning. In the traditional teaching mode, the positioning of teachers is often the role of knowledge preachers. Teachers are in a major position, while students are in a minor position. Currently, the process of acquiring database knowledge primarily involves studying the Oracle database library and SQL statements. In the process of teachers in accordance with their own teaching concepts, students are filled with duck-like education. They do not consider the actual situation of the students or the students' self-awareness. This will result in conflicts between students and teachers, which will have an impact on students' learning.

The database application course specifically uses the flipping class. In order to better help students study database knowledge, schools should strengthen the application of the classroom teaching model and promote the combination of two organic combinations. In the actual operation, teachers can take corresponding measures from the following three aspects:

(1) A preview of the knowledge points is provided before class. Before the class starts, teachers should record the corresponding learning videos for students and distribute some

related information to the corresponding teaching platform. In the video, teachers can explain a knowledge point or arrange some simple tasks to help students understand what they need to learn. For example, when studying the system permissions in the Oracle database, teachers can start with the two permissions of SYS and System to guide students to explore the content they want to learn, and then use short video to give students time to explain user creation methods and precautions. Next, teachers need to use 5-6 minutes of video time to explain the differences between system permissions and object permissions in detail so that students can understand the differences and avoid incorrect writing. Finally, the teacher needs to insert related exercises in the video. Through these exercises, students can achieve the goal of self-testing, improving their own understanding of knowledge points and realizing good learning.

(2) In-depth exploration of knowledge points in the class. Classroom learning is the main study time for students, and teachers should make full use of this time to improve the efficiency of students' learning. In actual operation, teachers should clarify their teaching status, change the traditional dominant teaching status, and provide good knowledge guidance for students. At the same time, teachers can adopt group discussions to allow students to discuss the problems existing in the videos in front of the class and then give detailed answers to the common existing questions to help students better understand the knowledge points. For example, when learning the point of view user permissions, teachers can let students summarize what system permissions are and object permissions are, then discuss the difference between the two and give the corresponding basis. In the process, teachers should guide students to discuss in terms of sentences, grammar, etc., and encourage students to bravely express their opinions. Put some unified issues in the group for discussion. Finally, the teacher summarized this and announced the correct answer. After such teaching, teachers can give full play to the role of classroom teaching and improve students' efficiency in database knowledge learning.

(3) After class, students consolidate and deepen their knowledge points. As an important stage of consolidation and deepening of knowledge points after class, it can help students better integrate and penetrate the knowledge points. As a result, it is critical to strengthen the planning for this learning stage. In order to implement active teaching in classrooms, teachers need to carefully design teaching activities and learning resources. In the specific operation process, teachers can help students consolidate knowledge points by formulating relevant training tasks. Teachers can continue to use discussion to split a training task into multiple different stages and then allow different groups to complete different stages of the tasks. This can not only cultivate students' ability to explore knowledge points independently but also improve students' ability to engage in cooperative learning. When evaluating students' learning results, in addition to traditional examination methods, you can also consider using various evaluation methods such as project operations, practical operations, and group reports to comprehensively measure students' learning effects and practical skills. For example, make high-quality teaching videos, design targeted practical projects, organize group discussions, and conduct case analysis. At the same time, teachers also need to guide students to actively participate in classroom activities and encourage them to ask questions and share their views. For example, teachers can split the user permissions and transfers so that different groups can complete different stages, such as user creation, permissions granting, and transmission. In this way, teachers can better understand the situation of students' knowledge points so as to take more targeted measures to help students learn and realize personalized teaching. In addition, after this training, students can better consolidate and deepen in terms of authority statements and format writing.

RESULTS AND DISCUSSION

1. Teacher experience and teaching reflection:

This section summarizes the experiences and reflections of teachers during the process of implementing classroom teaching practices, focusing on the enhancement of teaching methods, the utilization of teaching resources, and the management of the classroom. For example, in the first class, the teacher sent a database system curriculum teaching outline to each student and explained it in the classroom to allow students to clarify curriculum goals, curriculum content, teaching key and difficulties, teaching progress, assessment methods, and assessment. Reference methods, reference books, and their respective roles during the teaching process. Immediately afterwards, through the interaction of teachers and students, they adopted the reasonable proposal of the students, adjusted the inappropriate content, and drafted the first draft of the teaching outline of the teachers and students.

2. Comparative analysis with traditional teaching models:

Conduct a comparative analysis between the flipped classroom and traditional teaching models, demonstrating the advantages of the flipped classroom in stimulating students' learning interests, improving self-directed learning abilities, and enhancing team cooperation. For example, after learning the supporting techniques such as database design steps and normalization theory, students can freely form teams with 3-4 people in each group. Firstly, topic selection should be conducted on a group-by-group basis with a certain level of practical significance, and each group should have a certain level of familiarity with the application background and business logic of the topic. Then, each group is required to evaluate the participation of each member in group activities and then conduct internal evaluations. The evaluation content includes both the completion of technical tasks and the performance of management tasks, such as execution ability, enthusiasm, team cooperation, and attendance at group meetings. Finally, the group determines the final grades of students through comprehensive peer evaluation and teacher evaluation.

CONCLUSIONS

As a new way of teaching, to better play the role of the flipped classroom in database knowledge teaching, the school needs to take corresponding measures from the three learning stages of the class: middle and later. Teachers need to record related learning videos for students in front of the classroom and cultivate students' interest in learning through videos. To prevent students from learning, teachers should try to make the video language more popular and fun. On the other hand, in classroom teaching, teachers should clarify their teaching status and provide effective guidance to students. Teachers should start with students' perspectives and teach according to their actual situation. Finally, during the post-school learning stage, teachers can arrange related training tasks to assist students in consolidating and mastering the knowledge points.

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