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The Application of "Problem-Based Learning + Flipped Classroom" Teaching Model in Bilingual Education

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Abstract: This study focuses on the application of the "PBL (problem-based learning) + Flipped Classroom" teaching model in bilingual education, aiming to explore its potential to enhance the quality and effectiveness of bilingual teaching. PBL emphasizes learning through the resolution of real-world problems, while the Flipped Classroom advocates that students acquire basic knowledge through self-study before class, dedicating class time to in-depth discussions and practical activities. The integration of these two teaching models in bilingual education aims to stimulate students' interest in learning, improve their autonomous learning abilities, enhance critical thinking, and foster cross-cultural communication skills. Through literature review, case analysis, and empirical research, this study first examines the current applications and challenges of PBL and the Flipped Classroom in bilingual education. Subsequently, it elaborates on the specific implementation steps of the "PBL + Flipped Classroom" teaching model in bilingual education, including problem design, preview material provision, cooperative learning, classroom activities, and language support. A comparative experiment is then conducted to analyze the impact of this teaching model on students' learning motivation, academic performance, and cross-cultural communication skills. The results indicate that the "PBL + Flipped Classroom" teaching model significantly improves students' learning motivation and participation, enhances academic performance, and effectively boosts their cross-cultural communication skills. Furthermore, this model aids in cultivating students' autonomous learning abilities and critical thinking, providing an innovative and effective approach to bilingual education. This study offers new ideas and insights for the field of bilingual education, which is of great significance for promoting the innovation and development of bilingual teaching models.

Keywords: Problem-based learning; Flipped classroom; Bilingual education; Learning motivation; Academic performance; Cross-cultural communication skills

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1. Introduction

In today's globalized world, bilingual education has emerged as a pivotal means of cultivating talent with an

international perspective and cross-cultural communication skills. However, traditional bilingual teaching models often focus on knowledge instillation and language application, failing to fully develop students' learning initiative and thinking abilities. Therefore, exploring a teaching model that fosters active learning and cognitive development among students is of paramount importance. Among them, problem-based learning (PBL) combined with the Flipped Classroom teaching model shows great potential in bilingual education due to its unique advantages. PBL is a learning method based on problems and tasks, which encourages students to actively explore and solve problems by placing them in real-world situations, thereby cultivating their critical thinking, cooperation skills, and problem-solving skills [1]. The Flipped Classroom is a teaching strategy where students acquire basic knowledge through self-study of textbooks or online resources before class, with class time used for in-depth discussions, applications, and practical activities to promote deeper learning and thinking [2].

Combining PBL with the Flipped Classroom can not only stimulate students' interest and motivation in learning but also improve their autonomous learning abilities, critical thinking, and language skills, bringing innovation to bilingual education. This study aims to explore the application of the "PBL + Flipped Classroom" teaching model in bilingual education and analyze its impact on students' learning motivation, academic performance, and cross-cultural communication skills. Specifically, this study seeks to answer the following questions:

(1) How is the "PBL + Flipped Classroom" teaching model applied in bilingual education?

(2) What is the impact of this teaching model on students' learning motivation and academic performance?

(3) How does this teaching model promote students' cross-cultural communication skills?

By answering these questions, this study aims to provide an innovative teaching model for bilingual education, offering references for educational practice and policy formulation. This paper will first review relevant literature to explore the current application and challenges of PBL and the Flipped Classroom in bilingual education. Subsequently, it will introduce in detail the specific application of the "PBL + Flipped Classroom" teaching model in bilingual education and analyze its teaching effects through case studies. Finally, this paper will summarize the research findings and propose future research directions. Through this research, we hope to provide new ideas and inspirations for the field of bilingual education, further promoting the innovation and development of bilingual teaching models.

2. Literature review

2.1. Application and effects of PBL in bilingual education

The application of the PBL teaching model in bilingual education has achieved certain results. Wu and Liu applied the PBL teaching model in a solid physics bilingual course and found that it could significantly improve students' autonomous learning abilities and innovation abilities [3]. Similarly, Guo adopted the PBL teaching method in online Chinese teaching for Hong Kong and Macao Chinese children, and the results showed that this model could effectively enhance students' language application skills and learning interests [4]. These studies indicate that the PBL teaching model has the potential to promote students' active learning and improve learning effects in bilingual education.

2.2. Practice and challenges of the Flipped Classroom in bilingual education

As an emerging teaching model, the Flipped Classroom has also been widely applied in bilingual education.

Kang and Ye constructed a Flipped Classroom model in microeconomics bilingual teaching and found that it could improve students' class participation and learning effects [5]. However, the Flipped Classroom also faces some challenges in bilingual education, such as insufficient student autonomous learning abilities and scarcity of teaching resources [6]. Therefore, how to effectively implement the Flipped Classroom and fully leverage its advantages in bilingual education still requires further exploration and practice.

2.3. Application cases of the "PBL + Flipped Classroom" teaching model in other fields

The "PBL + Flipped Classroom" teaching model has also achieved remarkable results in other fields. For example, in medical education, the "PBL + Flipped Classroom" model is widely used in medical cosmetology education [7] and clinical immunology testing technology [8], effectively improving students' learning effects and clinical thinking abilities. These successful cases provide useful references for the application of the "PBL + Flipped Classroom" teaching model in bilingual education.

2.4. Deficiencies in existing research and the innovation of this study

Although PBL and the Flipped Classroom have achieved certain application results in bilingual education, existing research still has some deficiencies. First, there are relatively few specific cases and empirical studies on the application of the "PBL + Flipped Classroom" teaching model in bilingual education. Second, most existing studies focus on the application effects of a single teaching model and lack systematic research on the combined application of multiple teaching models. Therefore, this study aims to fill this research gap by exploring the application effects of the "PBL + Flipped Classroom" teaching model in bilingual education and its impact on students' learning motivation, academic performance, and cross-cultural communication skills through empirical research.

3. Methodology

3.1. Data collection

3.1.1. Sample selection

This study recruited 45 and 40 students from the 2020 and 2021 grades of the Marketing major at Chuzhou University, respectively, during the second semester of the 2022–2023 and 2023–2024 academic years, totaling 85 participants. The participants, aged 20.0 ± 1.0 years, had all completed the theoretical and practical content of the International Marketing course. There were no statistically significant differences between the two groups of students in terms of gender, age, and academic performance (based on the final grades of the previous semester), indicating comparability.

3.1.2. Questionnaire design

The questionnaire design comprises the following main sections:

(1) Student basic information: Including gender, age, and final grades of the previous semester.

(2) Teaching model acceptance: Using a Likert five-point scale to assess students' acceptance of the "PBL + Flipped Classroom" teaching model, ranging from very unacceptable to very acceptable.

(3) Learning effects: Using a Likert five-point scale to evaluate students' learning effects under this teaching model, including knowledge mastery, skill enhancement, and learning interest.

(4) Learning motivation and autonomous learning abilities: Assessing changes in students' learning motivation, autonomous learning abilities, critical thinking, and cross-cultural communication skills

under this teaching model.

(5) Open-ended questions: Collecting specific feedback and suggestions from students on this teaching model.

3.2. Data analysis

3.2.1. Quantitative analysis

(1) Descriptive statistical analysis: Conducting descriptive statistical analysis on students' basic information, teaching model acceptance, and learning effects.

(2) Independent sample *t*-test: Comparing the differences between 2020 and 2021 grade students in various evaluation indicators.

(3) Correlation and regression analysis: Analyzing the correlation between learning motivation, autonomous learning abilities, and learning effects.

3.2.2. Qualitative analysis

For open-ended questions, content analysis was used for coding and theme extraction to summarize students' positive feedback, suggestions for improvement, and challenges faced regarding the "PBL + Flipped Classroom" teaching model.

4. Results

4.1. Quantitative analysis results

The quantitative analysis results are as follows:

(1) Student basic information: The average age of the participating students was 20.0 years, with a standard deviation of 1.0 years; 42% were male, and 58% were female.

(2) Teaching model acceptance: The average score for students' acceptance of the "PBL + Flipped Classroom" teaching model was 4.2 (out of 5), with a standard deviation of 0.8, indicating that students generally accepted this teaching model.

(3) Learning effects: The average scores for knowledge mastery, skill enhancement, and learning interest were 4.1, 4.0, and 4.3, respectively, all showing high evaluations, which indicates that the "PBL + Flipped Classroom" teaching model has a significant effect on improving students' learning effects.

(4) Independent sample *t*-test: Comparing the differences between 2020 and 2021 grade students in various evaluation indicators, the results showed no significant differences in teaching model acceptance ($t = 1.54$, $P = 0.13$), knowledge mastery ($t = 0.97$, $P = 0.34$), skill enhancement ($t = 0.78$, $P = 0.44$), and learning interest ($t = 1.23$, $P = 0.22$). This suggests that the application effects of the "PBL + Flipped Classroom" teaching model are relatively stable among students of different grades.

(5) Correlation and regression analysis: The correlation coefficient between learning motivation and learning effects was 0.72 ($P < 0.01$), indicating a significant positive correlation. The correlation coefficient between autonomous learning abilities and learning effects was 0.68 ($P < 0.01$), also indicating a significant impact.

4.2. Qualitative analysis results

The qualitative analysis results are as follows:

(1) Positive feedback: 65% of students believed that the "PBL + Flipped Classroom" teaching model improved their learning interest and autonomous learning abilities, and was helpful in cultivating critical thinking and cross-cultural communication skills. For example, some students stated, "This teaching model makes me more actively engaged in learning. Through problem-solving and cooperative learning, I not only mastered knowledge but also learned how to apply it to solve practical problems."

(2) Suggestions for improvement: 20% of students suggested increasing the diversity and interactivity of preview materials, as well as providing more discussion and cooperation opportunities in class. They believed that this could further improve learning effects and interest. For example, some students suggested, "Teachers can provide more preview materials related to the course content, such as videos and cases, to help us better understand the course content. At the same time, increasing discussion and cooperation in class can allow us to better exchange ideas and share experiences."

(3) Challenges and difficulties: 15% of students reflected that they had insufficient time for previewing before class and that language barriers affected communication effectiveness in class discussions. They hoped that teachers could provide more guidance and support to help them overcome these difficulties. For example, some students stated, "Due to the large amount of course content and limited preview time, it is sometimes difficult to fully understand the course content. Additionally, in class discussions, due to limited language proficiency, it is sometimes difficult to accurately express one's viewpoints."

5. Discussion

5.1. Advantages of the "PBL + Flipped Classroom" teaching model in bilingual education

(1) Improving student participation: Through problem design and cooperative learning in the PBL teaching model, students need to actively participate in discussions and problem-solving, thereby improving class participation. At the same time, the Flipped Classroom model requires students to self-study basic knowledge before class to prepare for class discussions, which further enhances student participation.

(2) Enhancing autonomous learning abilities: The Flipped Classroom model requires students to acquire basic knowledge through self-study before class, which helps cultivate their autonomous learning abilities. The problem-orientation and cooperative learning in the PBL teaching model further promote students' autonomous learning and thinking.

(3) Promoting cross-cultural communication skills: Applying the "PBL + Flipped Classroom" teaching model in bilingual education can provide students with more language practice opportunities. Through class discussions, cooperative learning, and case analysis, students can better use the language they have learned for communication and expression, thereby improving their cross-cultural communication skills.

5.2. Possible problems encountered during implementation and the solutions

(1) Insufficient autonomous learning abilities of students: For students with insufficient autonomous learning abilities, teachers can help them by providing rich and diverse preview materials and online resources. Additionally, teachers can set some guiding questions and discussion sections in class to stimulate students' interest and initiative in learning.

(2) Scarcity of teaching resources: To effectively implement the "PBL + Flipped Classroom" teaching model, rich teaching resources are required. Schools can strengthen information construction and provide more online courses and teaching resource libraries for student use. Furthermore, teachers can actively develop and utilize localized teaching resources and cases to enrich teaching content.

(3) Language barriers affecting communication effectiveness: To address language barriers that affect communication effectiveness in class discussions, teachers can provide language support and guidance to help students overcome this difficulty. For example, teachers can set up dedicated language tutoring sessions or provide language learning resources for students to refer to. At the same time, teachers can encourage students to use the language they have learned for communication and expression in class to improve their language application skills.

5.3. Similarities and differences from existing research and reason analysis

Compared with existing research, this study has certain innovations in sample selection, data collection, and analysis methods. First, this study selected students majoring in Marketing as the research object, which has strong pertinence and practicality. Second, this study used a combination of methods such as questionnaires, experimental comparisons, and qualitative analysis for data collection and analysis, enabling a more comprehensive exploration of the application effects of the "PBL + Flipped Classroom" teaching model in bilingual education. Finally, this study also proposed specific solutions and improvement suggestions for possible problems encountered during implementation, providing useful references for teaching practice.

6. Conclusion

This study empirically investigated the application effects of the "PBL + Flipped Classroom" teaching model in bilingual teaching and its impact on students' learning motivation, academic performance, and cross-cultural communication skills. The results indicate that the "PBL + Flipped Classroom" teaching model can significantly enhance students' learning motivation and participation, promote the improvement of academic performance, and effectively strengthen students' cross-cultural communication skills. In addition, this model also contributes to cultivating students' autonomous learning abilities and critical thinking, providing an innovative and effective approach to bilingual teaching.

In future research, it is advisable to further explore the application effects of the "PBL + Flipped Classroom" teaching model across different disciplines and cultural backgrounds. Additionally, efforts should be made to better integrate online and offline teaching resources to construct a more comprehensive bilingual teaching system. Meanwhile, more specific solutions and improvement suggestions can be proposed to address the problems and challenges encountered during implementation, thereby promoting the widespread application and in-depth development of this teaching model in bilingual teaching.

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Disclosure statement

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References

[1] Meng SJ, Zhang M, Wang R, et al., 2023, Exploration and Practice of Research-Based Teaching Mode Based on PBL and Bilingual Teaching. Journal of Higher Vocational Education, 9(36): 45–48.

[2] Xie G, Jing LY, Jia XN, 202,. Research on the Application of MOOC-Embedded Flipped Classroom in Bilingual Teaching: A Case Study of Solid Waste Treatment and Disposal Course. Journal of Higher Vocational Education, 8(11): 128–131.

[3] Wu X, Liu Y, 2024, Research and Exploration on the Localization Application of PBL Teaching Mode: A Case Study of Solid Physics Bilingual Course. Physics Bulletin, (05): 7–10.

[4] Guo J, 2023, Research on Online Chinese Teaching for Hong Kong and Macao Chinese Children Based on PBL Teaching Method, dissertation, Jilin International Studies University.

[5] Kang GQ, Ye Y, 2023, Research on the Construction of a Flipped Classroom Model for Bilingual Teaching of Microeconomics Based on Cognitive Load Theory. Finance, (06): 94–96.

[6] Yao Y, 2023, Research on the Integrated Application of the "Flipped Classroom + SPOC" Mixed Teaching Mode in the Bilingual Course of Marketing. Industry and Science Forum, 22(07): 194–195.

[7] Wang J, Cai Y, Wen Y, et al., 2024, Application and Challenges of PBL Teaching Method Combined with Bilingual Teaching in Medical Cosmetology Education. Continuing Medical Education, 38(04): 57–60.

[8] Wang Q, Lu XL, Du Q, et al., 2023, Investigation and Analysis of the Reform in Teaching Mode of Clinical Immunology Testing Technology. Continuing Medical Education, (01): 21–24.