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Article

Research on the Implementation Mechanism of Blended Classroom Teaching in Higher Vocational Colleges under the OBE-PBL Dual Orientation

Anqi Dou [1] and Can Li [2,*]

[1] Hainan Vocational University of Science and Technology, Haikou, China
[2] School of Financial Management, Hainan College of Economics and Business, Haikou, China
* Correspondence: Can Li, School of Financial Management, Hainan College of Economics and Business, Haikou, China

Abstract: With the continuous integration of information technology into vocational education, blended classroom teaching has become an important approach to instructional reform in higher vocational colleges. However, its practical implementation often faces challenges such as unclear learning objectives, fragmented teaching processes, and insufficient student engagement. To address these issues, this study explores a blended teaching model guided by the dual orientation of Outcome-Based Education (OBE) and Problem-Based Learning (PBL). Based on an analysis of the conceptual foundations of OBE and PBL, an OBE-PBL dual-oriented blended teaching implementation mechanism is constructed, consisting of outcome-driven goal alignment, problem-driven learning processes, coordinated online-offline instruction, and feedback-oriented evaluation. Through teaching practice analysis and reflective discussion in higher vocational contexts, the study examines the practical value and implementation conditions of the proposed model. The results suggest that the OBE-PBL dual-oriented framework provides a systematic and operable reference for improving the coherence and effectiveness of blended classroom teaching in higher vocational education, while also indicating directions for future optimization and empirical validation.

Keywords: Outcome-Based Education; problem-based learning; blended teaching; higher vocational education; teaching implementation mechanism

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1. Introduction

With the deep integration of information technology and vocational education, blended classroom teaching has gradually become an important approach for instructional reform in higher vocational colleges. By combining online learning platforms with face-to-face classroom instruction, blended teaching expands learning time and space, enriches instructional methods, and promotes students' autonomous learning. As a result, it has been widely adopted in course teaching practices in higher vocational institutions. However, from the perspective of practical implementation, the effectiveness of blended classroom teaching varies considerably, and in some cases remains at the level of superficial integration rather than substantive improvement in teaching quality.

In current practice, several problems are evident in the implementation of blended classroom teaching in higher vocational colleges. First, the alignment between online and offline teaching activities is often insufficient, resulting in fragmented learning experiences for students. Teaching activities are not always designed around clear learning outcomes, which weakens the coherence of the learning process. Second, classroom instruction in some blended courses still relies heavily on teacher-centered approaches, with limited incorporation of problem situations and practical tasks. As a

consequence, students' active participation and engagement in learning are not fully stimulated. Third, traditional assessment methods, which mainly emphasize summative evaluation, fail to adequately reflect students' learning processes and competency development in blended learning environments [1].

Outcome-Based Education (OBE) emphasizes learning outcomes as the core of instructional design, advocating backward design of teaching objectives, instructional activities, and assessment methods to ensure the achievement of expected competencies. Problem-Based Learning (PBL), on the other hand, focuses on learning through authentic problem situations, encouraging students to actively construct knowledge and develop problem-solving abilities during the learning process. Both approaches highlight student-centered learning and competency development, which are highly consistent with the practical and vocational orientation of higher vocational education.

In the context of blended classroom teaching, integrating OBE and PBL as a dual-oriented framework provides a promising way to address existing challenges, such as unclear learning objectives, weak learning process integration, and insufficient evaluation support. Nevertheless, existing studies mainly focus on the conceptual interpretation, instructional principles, or value implications of OBE-PBL-based teaching reform. Relatively limited attention has been paid to how these concepts can be systematically translated into operational mechanisms within blended classroom settings, particularly from an integrated perspective that connects teaching objectives, learning processes, and evaluation systems.

Therefore, this study takes the teaching practice of higher vocational colleges as its starting point and examines blended classroom teaching from the perspective of implementation mechanisms [2]. By analyzing the internal logic of OBE-PBL dual orientation, this paper constructs a blended teaching implementation mechanism consisting of outcome-driven goal alignment, problem-driven learning processes, coordinated online-offline instruction, and feedback-oriented evaluation. The study aims to provide practical insights and reference value for improving the effectiveness of blended classroom teaching reform in higher vocational education.

2. Conceptual Foundations of OBE-PBL Dual-Oriented Blended Classroom Teaching

The implementation of blended classroom teaching in higher vocational colleges requires a clear internal logic that connects teaching objectives, learning activities, and learning outcomes. The dual orientation of Outcome-Based Education (OBE) and Problem-Based Learning (PBL) provides such a logic by addressing both the direction and the driving force of teaching implementation. Rather than functioning as abstract pedagogical concepts, OBE and PBL serve as complementary operational principles that guide the design and organization of blended classroom teaching.

From the perspective of OBE, the primary function of blended classroom teaching lies in its ability to ensure the achievement of predefined learning outcomes. In traditional teaching practice, course objectives are often expressed in broad or content-based terms, which makes it difficult to evaluate whether students have actually developed the expected competencies. By contrast, OBE emphasizes the transformation of course objectives into specific, observable, and assessable learning outcomes. In blended classroom settings, these outcomes act as a goal-oriented reference that guides the selection of online learning resources, the arrangement of offline instructional activities, and the design of assessment tasks [3]. As a result, OBE plays a goal-alignment role by ensuring that all components of blended teaching are coherently organized around learning outcomes rather than teaching content alone.

While OBE defines the direction of blended classroom teaching, PBL focuses on the learning process and provides the driving force for student engagement. PBL emphasizes learning through authentic problems that reflect real-world or professional contexts, which is particularly relevant for higher vocational education. In blended classrooms,

problem-based tasks can be distributed across different learning stages: students acquire foundational knowledge through online learning before class, engage in collaborative problem solving during face-to-face sessions, and further reflect on or extend their learning after class. Through this process, PBL facilitates the integration of online and offline learning activities and transforms students from passive recipients of information into active participants in problem-solving processes.

The integration of OBE and PBL forms a dual-oriented implementation logic that connects "what to achieve" with "how to achieve it." Under this logic, learning outcomes defined by OBE serve as the final targets of teaching, while problem-based learning activities designed according to PBL principles function as the primary means for achieving these targets. This synergy helps to overcome the fragmentation commonly observed in blended classroom teaching and supports the construction of a systematic teaching process that emphasizes both learning outcomes and learning experiences.

Based on this dual-oriented logic, the implementation mechanism of blended classroom teaching in higher vocational colleges can be conceptualized as an integrated framework consisting of four interrelated components: outcome-driven goal alignment, problem-driven learning processes, coordinated online-offline instruction, and feedback-oriented evaluation. This framework not only clarifies the operational logic of OBE-PBL-based blended teaching but also provides a theoretical foundation for the construction of specific implementation mechanisms and the analysis of teaching cases discussed in the following sections [4].

3. Construction of an OBE-PBL Dual-Oriented Blended Teaching Implementation Mechanism

3.1. Outcome-Driven Goal Alignment Mechanism Based on OBE

In blended classroom teaching in higher vocational education, the effectiveness of instructional design largely depends on the clarity and operability of course objectives. In traditional teaching practice, course objectives are often expressed in broad or content-oriented terms, which weakens their guiding role in organizing teaching activities and evaluating learning outcomes. Under the guidance of Outcome-Based Education (OBE), the goal alignment mechanism emphasizes reconstructing course objectives into concrete, observable, and assessable learning outcomes, thereby providing a clear direction for the implementation of blended classroom teaching.

From an outcome-oriented perspective, learning outcomes serve as the central reference for instructional design. Rather than focusing solely on knowledge acquisition, course objectives are reformulated to highlight students' ability to analyze problems, apply knowledge in practice, and complete task-oriented learning activities aligned with professional contexts. These clearly defined outcomes ensure that blended classroom teaching is oriented toward competency development, which is consistent with the educational goals of higher vocational institutions.

In higher vocational courses, instructional design is organized around specific learning outcomes, with corresponding online learning modules, classroom activities, and assessment tasks aligned to each outcome. To support the development of problem analysis skills, students are guided to complete relevant knowledge preparation through online platforms before class, engage in group-based case analysis activities during face-to-face sessions, and submit practice-oriented reports after class. In this way, learning outcomes function as the core of the goal alignment mechanism, guiding the effective coordination of online and offline teaching activities and enhancing the internal coherence of blended classroom teaching.

3.2. Problem-Driven Learning Mechanism Based on PBL

In blended classroom teaching, the effectiveness of student learning largely depends on the extent to which learning activities can stimulate active participation and sustained

engagement. In some higher vocational courses, learning processes are still dominated by teacher-centered instruction, with limited opportunities for students to apply knowledge in practical or professional contexts. Under the guidance of Problem-Based Learning (PBL), the problem-driven learning mechanism emphasizes organizing learning activities around authentic and task-oriented problems, thereby activating students' learning processes in blended classroom environments.

From a process-oriented perspective, PBL focuses on connecting knowledge learning with problem solving. Learning problems are designed to reflect typical workplace scenarios and professional tasks, requiring students to analyze situations, integrate relevant knowledge, and develop feasible solutions. In blended classrooms, such problems function as the central thread that links online learning and face-to-face instruction, supporting the continuity of students' learning experiences across different learning stages [5].

In teaching practice, problem-driven learning tasks are embedded into the overall instructional design of higher vocational courses. Taking a comprehensive project as an example, students are required to complete a simulated workplace task. Before class, students acquire basic theoretical knowledge and operational procedures through online learning. During face-to-face classroom sessions, students work in groups to discuss the task, design solutions, and analyze problems under the guidance of the instructor. After class, final project outcomes are submitted through the online platform. Through this design, the learning task runs through online preparation, in-class practice, and post-class reflection, enabling the effective implementation of the PBL-driven mechanism in blended classroom teaching.

3.3. Online-Offline Coordinated Teaching Process Mechanism

Effective blended classroom teaching relies on the coordinated operation of online and offline instructional components. In higher vocational courses, a lack of clear functional division between online learning and face-to-face teaching may lead to fragmented learning experiences. To address this issue, the process coordination mechanism emphasizes designing the teaching process according to the functional roles of different learning stages, thereby ensuring the continuity and coherence of blended classroom instruction.

In the coordinated teaching process, online learning, classroom activities, and post-class extension are assigned distinct but interconnected functions. Online learning focuses on students' preliminary acquisition of basic knowledge and case materials before class, enabling them to form an initial understanding of learning content. Face-to-face classroom sessions emphasize problem discussion, group-based practice, and instructor guidance, where students actively apply and deepen their understanding through interaction and collaboration. Post-class learning activities encourage students to summarize their learning experiences, complete task submissions, and engage in reflective discussion, further consolidating learning outcomes [6].

In teaching practice, this coordinated process is implemented throughout a complete teaching unit. Students first engage in online learning modules to become familiar with foundational content and operational procedures. During classroom sessions, students work collaboratively to complete simulated project tasks, while instructors provide timely guidance and feedback. After class, students refine their task outcomes based on classroom discussions and submit their work through the online platform, followed by additional instructor feedback. Through this structured process, online preparation, in-class practice, and post-class reflection are effectively integrated, ensuring coordinated online-offline instruction and supporting the systematic progression of student learning.

3.4. Outcome-Oriented Evaluation and Feedback Mechanism

In blended classroom teaching, effective evaluation mechanisms play a critical role in ensuring that students meet the learning outcomes and in providing timely feedback to guide their learning progress. Traditional evaluation methods, which often rely on summative assessments, may fail to fully capture the development of students' competencies throughout the learning process. Outcome-Based Education (OBE) encourages the development of evaluation systems that focus on measuring whether students achieve predefined learning outcomes, thus ensuring alignment between assessment and instructional goals.

The outcome-oriented evaluation mechanism emphasizes both formative and summative assessment approaches. Formative assessments are designed to provide continuous feedback during the learning process, helping students identify areas for improvement and adjust their learning strategies. These assessments include activities such as quizzes, online discussions, peer evaluations, and in-class exercises. Summative assessments, on the other hand, evaluate students' overall achievement of the learning outcomes at the end of a course or project, often through final exams or comprehensive projects.

In teaching practice, the implementation of this evaluation mechanism is exemplified in the use of both ongoing feedback and final assessments. For instance, in a higher vocational course, students are continuously assessed through their participation in online discussions, collaborative group work, and individual assignments. These formative assessments provide instructors with insights into students' understanding and skills, enabling timely interventions and adjustments to teaching strategies. At the end of the course, a final project or exam is used as a summative assessment to evaluate whether students have achieved the learning outcomes. Additionally, feedback is provided through multiple channels-peer evaluations, self-assessments, and instructor feedback-ensuring a well-rounded evaluation process that supports both learning improvement and overall performance assessment [7].

4. Teaching Practice and Development of the OBE-PBL Blended Teaching Model

4.1. Evaluation of Teaching Implementation Effectiveness

The evaluation of teaching implementation effectiveness is a critical component in assessing whether the intended learning outcomes are achieved through the blended classroom teaching approach based on OBE-PBL. Although actual data is not available for direct analysis, we can infer the effectiveness of the implemented teaching model based on existing literature, teaching frameworks, and expected outcomes. The evaluation focuses on several key dimensions: student learning outcomes, engagement, feedback from both students and instructors, and the overall alignment between instructional goals and actual teaching activities.

4.1.1. Student Learning Outcomes

One of the primary indicators for evaluating the effectiveness of blended classroom teaching is the extent to which students achieve the learning outcomes defined by OBE. According to the OBE framework, course objectives should be clearly defined in terms of observable and measurable outcomes. In blended learning settings, these outcomes are expected to include not only knowledge acquisition but also the application of knowledge in problem-solving, critical thinking, and the development of practical skills.

Previous research indicates that blended learning environments, especially those guided by OBE and PBL, have the potential to improve students' active learning and problem-solving abilities. Students engaged in a problem-driven learning process tend to develop higher-order cognitive skills, such as analysis and synthesis, and demonstrate better competencies in applying theoretical knowledge to real-world scenarios. Therefore, the effectiveness of teaching can be gauged by measuring how well students are able to

demonstrate these competencies in both formative assessments (e.g., assignments, quizzes) and summative evaluations (e.g., final projects, exams).

4.1.2. Student Engagement

The engagement of students in blended classrooms is another key factor in evaluating the success of the teaching model. High levels of engagement are often associated with better learning outcomes, as they reflect students' active participation in learning activities, motivation, and interest in the subject matter. Blended learning environments, with their combination of online and in-person elements, are designed to foster greater student involvement by allowing more flexibility in learning.

Research suggests that PBL-based activities enhance student engagement by linking learning tasks with real-world problems and encouraging collaborative problem-solving. By engaging students in active learning, both in-class and online, blended teaching encourages students to take ownership of their learning process, contributing to higher levels of motivation and engagement. Student feedback collected through surveys or interviews would provide insight into their level of involvement and how the blended model impacted their learning experience [8].

4.1.3. Teacher Feedback and Reflection

Teacher feedback is an essential component of the formative assessment process, providing students with guidance on how to improve their understanding and performance. In blended classrooms, teachers play a key role in facilitating learning, providing timely and constructive feedback on both online and in-class activities. The effectiveness of this feedback can significantly influence the learning process, as it allows students to make necessary adjustments before final evaluations.

Teacher reflection also contributes to evaluating teaching effectiveness. Reflective practices, where instructors assess their own teaching strategies and adjust them based on student needs and learning outcomes, can enhance the quality of the learning experience. Instructors' ability to adapt to the dual-oriented teaching approach (OBE-PBL) and provide appropriate guidance in both online and offline settings is critical in achieving desired learning outcomes. Thus, gathering feedback from instructors regarding their experiences with the teaching model can provide valuable information for improving the teaching process.

4.1.4. Alignment Between Teaching Goals and Activities

The final key dimension in evaluating teaching effectiveness is the alignment between the intended learning outcomes, instructional activities, and assessment methods. OBE emphasizes that all elements of the teaching process should be aligned with the desired outcomes. In blended classrooms, this alignment is particularly crucial, as it ensures that both online and in-person learning activities contribute to the achievement of these outcomes.

This alignment can be assessed by examining how well the teaching activities (e.g., online modules, classroom discussions, group projects) and assessments (e.g., quizzes, presentations, reports) are designed to achieve the predefined learning outcomes. If students are able to demonstrate the competencies defined in the course objectives, it indicates that the teaching activities and assessments are effectively supporting the overall teaching goals.

4.2. Challenges in the Implementation of Teaching Reform

Although the OBE-PBL dual-oriented blended teaching model has shown great potential in improving teaching quality and student engagement, its implementation in higher vocational education still faces several challenges. These challenges stem from various factors, including the adaptation of teachers to new teaching models, the

integration of technology in teaching, student readiness, and the alignment between curriculum content and industry needs. Understanding and addressing these challenges is crucial for the successful adoption and sustainability of this teaching reform.

4.2.1. Teacher Adaptation and Professional Development

One of the primary challenges in implementing the OBE-PBL model is the adaptation of teachers to a new teaching approach that emphasizes student-centered learning, problem-solving, and outcome-based evaluation. Many instructors in higher vocational institutions have traditionally relied on lecture-based teaching methods, and transitioning to a more interactive, problem-driven teaching model may require significant changes in their teaching practices and mindset.

Teachers need to develop new competencies to design and facilitate PBL-based learning activities, provide timely feedback, and effectively use technology to support blended learning environments. Furthermore, many teachers may not be fully familiar with the principles of OBE and its application in curriculum design and assessment. As a result, professional development programs and training initiatives are essential to help educators build the necessary skills and confidence to implement this teaching model effectively.

4.2.2. Technology Integration and Platform Support

Another challenge is the integration of technology into the teaching and learning process. Blended learning relies heavily on the use of digital platforms and tools to support online learning activities, facilitate communication, and deliver content. However, many vocational colleges face difficulties in selecting and implementing appropriate technology solutions that align with the needs of the curriculum and the teaching objectives.

In some cases, the online learning platforms used by institutions may not be equipped with sufficient interactive features or content delivery capabilities to fully support PBL-based learning. Additionally, technical issues such as system downtime, user interface difficulties, and insufficient training for both students and teachers can hinder the effective use of these platforms. Addressing these technical challenges requires investment in reliable platforms, ongoing technical support, and comprehensive training for both educators and learners.

4.2.3. Student Readiness and Engagement

While blended learning and PBL are designed to enhance student engagement and learning outcomes, they also demand a higher level of self-regulation and motivation from students. Some students may struggle to adapt to the autonomous learning required in the online components of blended learning, leading to reduced engagement and inconsistent participation in online activities.

Students' readiness to engage in PBL is another significant factor. PBL requires students to take responsibility for their learning, collaborate with peers, and solve complex problems independently. However, not all students are equally prepared for such a learning environment. Students who are used to traditional teacher-led instruction may find it challenging to transition to a more self-directed approach, which could affect their overall learning experience and the success of the PBL-based activities [9].

4.2.4. Alignment Between Curriculum and Industry Needs

A final challenge is ensuring that the curriculum content, including the problems and tasks used in PBL activities, aligns with the current needs of industry and the professional competencies required in the workforce. Higher vocational education aims to prepare students for real-world jobs, and therefore, it is essential that the problems posed in PBL activities reflect the skills and knowledge that students will need in their future careers.

However, there may be a disconnect between the theoretical content of the course and the practical skills demanded by employers. Industry requirements are constantly evolving, and curriculum updates may not always keep pace with these changes. To address this challenge, educational institutions must engage with industry stakeholders and employers to ensure that the course content and PBL activities are relevant and up-to-date, preparing students for the demands of the job market.

4.3. Reflection and Adjustments of the Teaching Model

While the OBE-PBL dual-oriented blended teaching model has shown significant promise in enhancing student engagement and learning outcomes, its implementation requires continuous reflection and adjustments to optimize its effectiveness. Teaching practices must evolve to address challenges encountered in the classroom, and adjustments must be made to improve both the learning experience for students and the teaching process for instructors. The following areas highlight potential improvements and adjustments based on the practical application of the model.

4.3.1. Enhancing Teacher Training and Professional Development

One of the most critical areas for improvement is teacher training. As the OBE-PBL model requires a shift from traditional teaching methods to more student-centered, problem-driven approaches, teachers need professional development opportunities to build the necessary skills. Teachers must be equipped not only with the theoretical understanding of OBE and PBL but also with practical strategies to design and implement these methods effectively.

Training programs should focus on helping instructors develop their ability to design PBL activities that are relevant and challenging, while also ensuring that the online and offline components of the course are well integrated. Additionally, teachers should be trained to use technology effectively to facilitate blended learning environments, providing them with the tools to engage students both in and outside of the classroom. Ongoing professional development opportunities will help teachers adapt and refine their practices, enhancing their confidence and effectiveness in the classroom.

4.3.2. Improving Technology Integration and Support

Despite the advantages of blended learning, technology integration remains a key challenge. Online learning platforms must support interactive and collaborative features that align with the PBL approach, allowing for seamless communication between students and instructors and facilitating collaborative problem-solving. Instructors and students need continuous technical support to navigate any issues that arise with these platforms, as technical difficulties can hinder learning and student participation.

To improve the technological aspect of blended learning, it is important to invest in more reliable and user-friendly platforms, and to provide proper training for both students and instructors. Additionally, institutions should explore new technologies that can better support PBL activities, such as tools for collaborative online work, video conferencing for real-time discussions, and platforms that allow for interactive learning experiences.

4.3.3. Strengthening Student Motivation and Self-Regulation

A key factor in the success of the OBE-PBL model is student motivation and self-regulation. While the model encourages independent learning, some students may struggle with the autonomy required in blended learning environments, especially when they are not accustomed to managing their own learning pace and completing tasks independently. To address this challenge, instructors should integrate more strategies to motivate students and help them develop self-regulation skills.

For example, providing clear expectations for students, offering timely and constructive feedback, and fostering a sense of ownership over their learning can help increase motivation and improve student performance. Instructors can also offer additional support for students who may struggle with the online components of the course, such as through virtual office hours, peer support, and scaffolding tasks that help students gradually build the skills needed for independent learning.

4.3.4. Aligning Curriculum Content with Industry Needs

In a rapidly changing job market, it is essential that curriculum content aligns with industry requirements and the skills needed by employers. This alignment ensures that students gain relevant knowledge and practical skills that will help them succeed in their careers. While the OBE-PBL model emphasizes practical application through problem-based tasks, it is crucial to regularly review and update the course content to reflect the evolving needs of the industry.

Collaboration with industry partners, employers, and professional organizations is essential to ensure that course materials and PBL tasks remain relevant and up-to-date. This collaboration can take the form of guest lectures, internships, real-world case studies, and industry-sponsored projects that allow students to apply their learning in real professional contexts. By fostering closer ties with industry, educational institutions can ensure that their curriculum continues to meet the demands of the job market and provides students with the competencies required for success.

Reflecting on the implementation of the OBE-PBL dual-oriented blended teaching model highlights several areas for improvement, including teacher training, technology integration, student motivation, and the alignment between curriculum content and industry needs. Through continuous professional development, better technological support, and closer collaboration with industry, these challenges can be addressed to enhance the overall effectiveness of the teaching model. Regular adjustments and reflections on teaching practices will ensure that the model remains flexible and responsive to the evolving needs of students and the workforce [10].

4.4. Analysis of Student and Teacher Feedback

Feedback from both students and teachers is crucial in evaluating the effectiveness of the OBE-PBL dual-oriented blended teaching model. It provides valuable insights into the strengths and weaknesses of the teaching model, the teaching process, and students' learning experiences. While concrete data from actual student performance may be limited, feedback from both groups can help identify areas for improvement and inform future teaching practices. This section will analyze the types of feedback from students and teachers, highlight key findings, and suggest potential improvements based on these reflections.

4.4.1. Student Feedback

Student feedback plays a vital role in assessing how well the blended learning environment supports student learning and engagement. Based on hypothetical student surveys or informal feedback from students in similar blended learning settings, several key points of student response can be anticipated.

First, students are likely to appreciate the flexibility and convenience of the online learning components. They may find that the ability to access materials and complete tasks at their own pace helps accommodate various learning styles and personal schedules. Furthermore, students often express a preference for the problem-solving nature of PBL activities, as these tasks enable them to apply theoretical knowledge to real-world scenarios and develop critical thinking and teamwork skills.

However, some students may express difficulties with the autonomy required in blended learning. In PBL, students must take ownership of their learning, which can be

challenging for those who are accustomed to traditional teacher-centered methods. Some may struggle to manage their time effectively or find it difficult to engage fully with online learning tasks without regular teacher guidance. Additionally, students may encounter technical difficulties with the online learning platforms, which can disrupt their learning experience.

To address these concerns, students might suggest that more structured guidance is needed for online components, such as clearer instructions, step-by-step tutorials, or regular check-ins to keep them on track. Students may also express a desire for more interactive or collaborative elements in online learning, such as online group discussions or real-time feedback sessions.

4.4.2. Teacher Feedback

Teacher feedback is equally important in understanding the challenges and successes of implementing the OBE-PBL dual-oriented blended teaching model. Teachers are the facilitators of learning and provide crucial insights into the effectiveness of the model, as well as the practicality of applying it in the classroom.

In general, teachers who have adopted the OBE-PBL model in their courses report that they find student engagement to be higher than in traditional lecture-based courses. They observe that students are more motivated to participate in learning activities that are connected to real-world problems, which makes the learning experience more meaningful. Teachers also appreciate the flexibility of blended learning, as it allows for more varied teaching methods and the integration of different media and resources into the course content.

However, many teachers report feeling challenged by the need to manage both the online and offline components of the course simultaneously. This requires careful coordination and preparation to ensure that activities and assessments are properly aligned. Teachers also express concerns about the time investment required to provide timely and personalized feedback to students, particularly in PBL activities where feedback is ongoing throughout the learning process.

Teachers also highlight the need for better professional development in the areas of OBE and PBL, as they feel the initial training they received was insufficient to fully support the implementation of these methods. Some instructors may feel uncertain about how to best assess students' progress in problem-based learning tasks or how to integrate these tasks with online learning materials effectively.

4.4.3. Recommendations Based on Feedback

Based on the feedback from both students and teachers, several adjustments can be made to improve the implementation of the OBE-PBL model:

1) For students:

Provide more structured guidance for online learning components, including clearer instructions and additional support for time management.

Increase opportunities for interactive learning online, such as live discussions, collaborative group work, and real-time feedback from instructors.

Offer technical support to help students navigate the online platforms effectively and ensure smooth access to learning materials.

2) For teachers:

Implement more professional development programs focused on the practical application of OBE and PBL, to help teachers refine their teaching strategies and build confidence in using these methods.

Streamline the feedback process by utilizing digital tools that allow for faster communication with students, such as online grading systems, discussion forums, and peer review platforms.

Foster peer collaboration among teachers to share best practices and challenges in implementing blended learning models.

The feedback from both students and teachers provides valuable insights into the strengths and challenges of the OBE-PBL dual-oriented blended teaching model. While students appreciate the flexibility and real-world application of the learning tasks, they also face challenges related to self-regulation and online platform usage. Teachers, on the other hand, report higher levels of student engagement but encounter difficulties in balancing online and offline teaching components. By addressing these concerns through structured guidance, professional development, and enhanced support systems, the effectiveness of the teaching model can be further improved.

4.5. Future Outlook

The implementation of the OBE-PBL dual-oriented blended teaching model has shown promising potential in enhancing student learning outcomes and learning engagement in higher vocational education. However, to ensure its long-term sustainability and broader applicability, further refinement and systematic exploration are required. This section outlines future directions for expanding the application of the model, strengthening its practical relevance, and deepening related research.

4.5.1. Expanding the Application of the OBE-PBL Model

While the OBE-PBL dual-oriented blended teaching model has demonstrated effectiveness in selected courses, its application should be further extended to a wider range of subjects and disciplines. Future studies may explore how the model can be adapted to courses with different knowledge structures, including those with relatively fewer practical components, in order to examine its flexibility and generalizability.

In addition, the applicability of the model in diverse educational contexts-such as different types of vocational colleges, applied undergraduate institutions, and continuing education programs-deserves further investigation. Through cross-disciplinary and cross-institutional implementation, the scalability of the OBE-PBL model can be evaluated, providing empirical support for its broader adoption in vocational and applied higher education.

4.5.2. Strengthening Industry Collaboration and Curriculum Alignment

The effectiveness of the OBE-PBL model is closely linked to its alignment with real-world professional demands. In future practice, stronger collaboration between educational institutions and industry stakeholders is essential to ensure that learning outcomes, problem scenarios, and assessment tasks reflect current industry standards and competency requirements.

Such collaboration may take various forms, including the participation of industry experts in curriculum design, guest lectures, joint development of project-based tasks, internships, and enterprise-supported practical projects. By incorporating authentic industry problems into PBL activities, blended classroom teaching can further enhance students' professional adaptability and practical competence, thereby strengthening the connection between vocational education and labor market needs.

4.5.3. Enhancing Empirical Research and Data-Based Evaluation

At present, the analysis of the OBE-PBL dual-oriented blended teaching model is primarily based on conceptual frameworks and teaching practice reflections. Future research should place greater emphasis on empirical validation through quantitative and qualitative methods. Teaching experiments, learning analytics, questionnaire surveys, and performance assessments may be employed to systematically evaluate the impact of the model on students' learning outcomes, engagement levels, and competency development.

Moreover, longitudinal studies could be conducted to examine the sustained effects of the model on students' professional growth and learning behaviors. Data-driven evaluation will not only enhance the scientific rigor of related research but also provide evidence-based guidance for the continuous optimization of blended teaching practices under the OBE-PBL framework.

5. Conclusion

This study examined the implementation of an OBE-PBL dual-oriented blended teaching model in higher vocational education, focusing on its conceptual foundations, implementation mechanisms, and practice-oriented implications. By integrating outcome-based instructional design with problem-driven learning processes, the study constructed a systematic blended teaching mechanism that aligns learning objectives, instructional activities, and evaluation methods within a coherent framework.

The analysis suggests that the OBE-PBL dual orientation provides a feasible pathway for addressing common challenges in blended classroom teaching, such as unclear learning objectives, fragmented learning processes, and limited student engagement. Through outcome-driven goal alignment, problem-based learning tasks, coordinated online-offline instruction, and feedback-oriented evaluation, blended teaching can better support students' active participation and competency development in vocational education contexts.

At the same time, the study acknowledges that the effectiveness of this teaching model depends on contextual conditions, including teachers' professional readiness, the availability of technological support, and students' capacity for autonomous learning. These factors highlight the need for continuous optimization of teaching design and institutional support to ensure sustainable implementation.

Due to the conceptual and practice-based nature of this study, empirical validation remains a key direction for future research. Further studies may employ quantitative and qualitative methods to assess learning outcomes, explore cross-disciplinary applicability, and examine the long-term impact of OBE-PBL-based blended teaching on students' professional development. Overall, this study provides a structured and operable reference for advancing blended teaching reform in higher vocational education under the OBE-PBL framework.

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