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Research Status, Practical Dilemmas, and Optimization Strategies of Blended Teaching in Universities

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Abstract: Blended teaching has emerged as a prominent subject in the recent reform and innovation of higher education. It has become imperative and guiding for colleges and universities to embrace a mixed teaching approach that aligns with the evolving needs of education and teaching in the new era. This paper aims to provide a comprehensive overview of the research status surrounding blended teaching, encompassing fundamental issues, teaching design, practical guidance, teaching effectiveness, and evaluation. By critically examining the current challenges associated with blended teaching, this study proposes optimization strategies including enhancing student participation and interaction, promoting deep learning, improving teachers' preparedness, teaching technologies, and curriculum design capabilities, strengthening top-level design, and perfecting evaluation and incentive mechanisms. These strategies provide new directions for the reform of blended teaching.

Keywords: Blended teaching; Research status; Practical dilemma; Optimization strategy

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1. Introduction

In the "Internet+" era, blended teaching has become the new norm of education and teaching. Blended teaching is a new teaching method that breaks through traditional face-to-face teaching and it is a teaching reform that effectively uses network conditions and resources to improve teaching efficiency. As early as 2003, Professor Kekang He introduced blended teaching in China, and he pointed out that the blended teaching model "should not only give full play to the leading role of teachers in guiding, inspiring, and monitoring the teaching process but also fully reflect the initiative, enthusiasm, and creativity of students." In 2018, the Ministry of Education proposed to adhere to the fundamentals, promote the "four returns," and build the low-quality course into five types of high-quality courses with depth, difficulty, and challenge, including online and offline hybrid high-quality courses." Implementation Plan for the Audit and Evaluation of Undergraduate Education and Teaching in Ordinary Colleges and Universities (2021–2025) pointed out that we should promote the "learning-centered, teaching-led" classroom teaching reform, promote the integration of information technology and

teaching process, strengthen the construction of online teaching resources, and improve the high-level, innovative, and challenging nature of the curriculum. It can be seen that promoting the reform of blended teaching has become an important way to improve the quality of teaching. This paper analyzes and expounds the current problems of blended teaching, and puts forward the optimization countermeasures of blended teaching, so as to provide more practical methods and strategies for researchers and practitioners of blended teaching.

2. Research status of blended teaching

2.1. Discussion on the basic issues of blended teaching

Based on the theory of blended teaching, scholars have discussed the basic issues of blended teaching based on different theoretical ideas, such as the primary teaching principle, active learning theory, mastery learning theory, and deep learning theory as the theoretical basis of blended teaching, and studied the teacher-student activities in the three stages of blended teaching—before, during, and after class [1]. Connectivism is a learning theory that adapts to the characteristics of networked learning, which explores the external mechanism of learning and reveals the learning process from different perspectives, providing a theoretical basis for blended teaching [2]. Blended teaching in the "Internet+" era is suitable for using constructivist theory to explain the acquisition of personalized knowledge, using connectivism theory to explain the generation of creative knowledge, and exploring the community model and the dynamic scaffold model of blended teaching. Previous studies mainly focus on the attitude and competency preparation requirements of blended teaching, and the reform of blended teaching is a multi-stage process, including the awareness period, the exploration period, and the deepening period. At each stage, teachers' attitudes and competency preparation are key factors. Some scholars have also summarized the rules and methods of teaching by exploring the combination of learner-centered theories and blended teaching practices, so that technology can better serve education and teaching, and optimize students' learning experience and effect [3].

2.2. Blended teaching design and practical guidance

Previous studies have focused on optimizing the design of blended teaching and constructed a variety of teaching models and frameworks, aiming to deeply explore the process and practical guidance strategies of blended teaching and verify the effectiveness through empirical research. From different perspectives, such as the concept of self-knowledge construction and interactive learning, researchers have put forward comprehensive design principles and methods for curriculum objectives, teaching content, teaching methods, teaching processes, teaching resources, and teaching effect evaluation [4]. These studies not only provide a rich reference model for blended teaching, but also emphasize the collaboration and communication between teachers and students, and encourage students to personalize their learning according to their interests. In the practice of massive open online course (MOOC) teaching, combined with the concept of deep learning, a blended MOOC teaching mode pointing to deep learning was constructed, which significantly improved students' deep learning ability and satisfaction. This model runs the deep learning route through the four stages of pre-class, in-class, post-class, and end-of-class, which is conducive to comprehensively cultivating students' comprehensive abilities such as independent learning, understanding, evaluation, reflection, knowledge transfer and practice, rational expression, and criticism. In order to ensure that blended teaching is efficient, effective, engaging, and personalized, the researchers have summarized four typical strategies that play an important role in improving teaching quality and student satisfaction. Empirical studies have shown that the application of precision teaching in blended teaching can help improve learning efficiency, enhance teacher-student interaction, and promote the development of students' higher-order thinking, such as self-directed learning, collaborative inquiry, and independent thinking [5].

In addition, the blended teaching mode in the smart classroom environment can improve teachers' teaching efficiency and students' self-directed learning effect. Based on text analysis technology, the intelligent interactive system provides intelligent support for blended teaching, such as early warning feedback, intelligent question and answer, and intelligent push of teaching resources, which has important reference significance for blended teaching of practical courses in colleges and universities [6].

2.3. Blended teaching effect and teaching evaluation

Based on the core principles of blended teaching evaluation design, relying on multivariate theoretical models and using diversified evaluation methods, scholars deeply analyzed the key factors affecting the effect of blended teaching and constructed a comprehensive set of blended teaching evaluation models and index systems. These indicators comprehensively consider multiple dimensions such as learning attitude and ability, learning performance and practical skills, teacher level, and teaching effectiveness. Among them, the evaluation model that pays special attention to learning completion and learning engagement emphasizes the importance of students' learning motivation and attitude. For MOOC-based blended teaching, scholars use specific indicators such as course pass rate, course engagement, student interaction with online content, and student satisfaction to measure teaching effectiveness comprehensively. At the same time, scholars proposed a blended teaching evaluation system that includes pre-class diagnostic evaluation, in-class process evaluation, and post-class final evaluation, which ensures the accuracy and effectiveness of evaluation through real-time interaction between teachers and students, big data collection and feedback, and quantitative evaluation. The "assessment ecology" model provides a new perspective for blended course learning evaluation [7], which focuses on the diversification of evaluation content, the diversity of evaluation subjects, and the flexibility of evaluation methods, and emphasizes the integration of process evaluation, summative evaluation, and learning outcome evaluation. In addition, it is recommended to build learning communities and use technological tools such as Audience Response System (ARS) to facilitate deep interaction between students and technology, peers, and teachers, improve classroom participation, and facilitate formative and summative assessment. The teacher's level of cognition, proficiency, and delivery style are also important factors that affect student engagement. In the future, the quality evaluation system of blended teaching should be constructed by means of big data, and under the premise of an immersive teaching environment, multiple evaluations should be promoted by tracing digital portraits, and various ways to realize blended teaching should be continuously explored, so as to actively reconstruct the new normal of education [8].

3. Practical dilemmas of blended teaching

3.1. Low student participation and insufficient teacher-student interaction

Although blended teaching has been extensively studied, there are not many studies that focus on student participation in blended teaching, and even fewer studies have been conducted experimentally. Currently, blended teaching faces multiple challenges, most notably inadequate learning support, low student engagement, and the emotional loneliness students may experience. The main challenges faced by students are the challenges of self-regulation and the use of learning technology. Effective teacher-student interaction can help improve student learning satisfaction, and the key to teacher-student interaction lies in teacher engagement. The main challenge for teachers is to interact online and create online resources in a timely manner, as well as to accurately assess students' online learning. While teachers can obtain some feedback through online tests and classroom interactions when assessing students' online learning performance, these methods have limitations. Test scores can be affected by a variety of factors, and it is difficult to fully reflect the actual level of students. Classroom

interactions, on the other hand, may not allow for immediate, comprehensive communication due to time constraints or technical barriers.

3.2. Low teaching preparation and inadequate teaching support

The main characteristics of blended teaching are the shift from teacher-centered to student-centered, and students change from passive acceptance to active participation in learning, while requiring teachers to innovate and adjust teaching methods and role positioning, and master specific teaching methods and skills. Blended teaching reform needs to be prepared at the institutional, faculty, and student levels, and the most critical is teacher preparation, but the current teaching preparation of university teachers is low. There are several key success factors for blended teaching, the most important of which are the curriculum design of blended learning and the teaching mode and methods of blended learning; it is necessary to focus on the research of blended instructional design, the tools of online courses, and the appropriate teaching methods in blended courses in the future. The current research on teaching support overlaps with the research on blended teaching strategies, and is relatively scattered, lacking a complete and systematic support framework to guide teachers on how to provide effective teaching support for students in blended teaching.

3.3. Insufficient institutional safeguards and lack of effective teaching evaluation

At present, the blended curriculum system of colleges and universities is still immature, and there is a lack of perfect blended curriculum construction, management, and evaluation mechanisms. Teachers generally lack an in-depth understanding and awareness of the connotation of blended curriculum and lack insight into its development potential. The traditional evaluation method is still used in blended teaching evaluation, and special evaluation tools are not designed in combination with the evaluation content and indicators of blended courses. Effective blended teaching evaluation requires systematic and long-term data collection, but the current evaluation mechanism and content are relatively simple, and there is a lack of effective institutional support and incentive mechanisms. The existing assessment and evaluation system focuses more on performance evaluation, ignoring the teaching effectiveness of students' "moral education," and the outcome evaluation and process evaluation cannot be implemented. Researchers are confused about what methods, frameworks, and tools should be used to evaluate blended teaching/curriculum. Although some scholars have proposed a detailed evaluation index system and constructed a systematic evaluation index system, covering the whole teaching process and assigning weights or scores, some of the index systems are complex and lack operability.

4. Optimization strategies for blended teaching

4.1. Improving student participation and promoting deep learning

Blended teaching focuses on cultivating students' self-directed and collaborative learning skills, and aims to improve their comprehensive skills in building knowledge systems, independent thinking, and problem-solving. The goal of this teaching model is to achieve the fundamental goal of promoting student "learning" by creating a highly engaging, personalized learning experience, rather than "blending for the sake of blending."

Blended teaching can shift from classroom to student-centered teaching, where students become active, interactive learners; increase interaction between student-teacher, student-student, student content, and external student resources; establish formative and summative comprehensive evaluation mechanisms for students and teachers; and build learning communities or other ways to facilitate interaction between learners and technology, peers, and teachers to improve the quality of learning and teaching satisfaction. Blended teaching provides methods and technical support for the transition from "shallow learning" to "deep learning." By effectively in-

tegrating online and offline resources, teachers can not only help students move from mechanical memory to in-depth understanding and application of knowledge but also further realize comprehensive ability cultivation and cultural value transfer.

4.2. Improving teaching preparation and strengthening teacher training

Universities should aim to prepare teachers for blended teaching attitudes and competencies, build professional development communities to improve teaching preparation and facilitate information sharing, and provide teachers with the necessary resources and support. At the same time, it provides teachers with support in teaching methods, including sharing excellent blended teaching cases, instructional design examples, and specific implementation steps. In addition, novice teachers and experienced peers should be encouraged to discuss resource utilization, skills enhancement methods, and problem-solving strategies, so as to develop a positive attitude towards blended teaching and enhance their confidence in blended teaching.

Whether it is the curriculum applicable to blended teaching, the role of blended teaching, or the curriculum evaluation and implementation of blended teaching, it is necessary to train teachers and provide professional development support for blended teaching. Colleges and universities can organize research and training on blended teaching, peer exchange activities, academic salon lectures, etc., to encourage teachers to participate in off-campus activities, modify their teaching models, and broaden the professional space for teachers' growth. With the successful application of the blended teaching model in the initial subjects, the model can be gradually extended to other disciplines to achieve the overall improvement of teaching. At the same time, online platforms are used to establish professional communities or forums to provide teachers with an environment for learning, discussion, and resource sharing, thereby comprehensively improving blended teaching preparation.

4.3. Reconstructing the top-level design and improving the evaluation system

Evaluation systems and assurance mechanisms are key to ensuring the effectiveness of blended teaching. Colleges and universities should pay attention to top-level design, establish a clear strategic plan and system for blended teaching, and support the development of blended teaching. At the same time, a dynamic incentive mechanism should be established to encourage some teachers to take the lead in trying blended teaching reform, promote all teachers to explore and reform blended teaching, improve teachers' teaching development, and effectively improve students' learning effectiveness.

In order to enhance the effectiveness of blended teaching, universities must build a diversified and comprehensive evaluation system. Based on teacher evaluation, blended teaching evaluation adopts student self-evaluation and teacher-student mutual evaluation, attaches importance to the main position of students in the evaluation process, and makes evaluation an interactive process in which managers, teachers, and students jointly participate. The multiple evaluation system not only includes the evaluation of the whole teaching process, but also emphasizes the all-round development of students, understands students' learning experience, and provides suggestions and support for optimizing teaching. Teachers should not only pay attention to students' mastery of knowledge but also focus on the acquisition of higher-order learning outcomes. The ability to use information technology should also be a key indicator in the evaluation of blended teaching. Combined with the characteristics of the evaluation object, the evaluation method should be flexible, diverse, simple, and easy, and the formative evaluation should be carried out by modern technical means, so as to improve the efficiency and scientificity of the evaluation. At the same time, on the basis of ensuring the comprehensiveness of the evaluation system, the evaluation indicators should be streamlined to improve their operability and practicability in practice.

5. Conclusion

The effective implementation of blended teaching requires not only policy and institutional support but also the upgrading of teachers' professional skills and the improvement of students' learning environments and resources. Blended teaching also faces many challenges in practice, including technical support, effective curriculum design, establishing a reasonable assessment system, and ensuring educational equity. In the future, we should focus on the application of blended teaching in different disciplines, and explore and optimize the integration strategy of online and offline resources. It is also necessary to pay attention to the evolution of teachers' roles and professional growth, develop targeted training and support mechanisms, and build an efficient and streamlined evaluation system. With the development of artificial intelligence, big data, and other technologies, how to apply new technologies to blended teaching, realize the personalization of learning paths and the accuracy of assessment, and drive the innovation and development of education models are also important research directions.

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