Exploration and Research on AI-Enabled Blended Teaching Mode

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Abstract. In today's digital age, the rapid integration of artificial intelligence technology into the field of education has brought unprecedented opportunities and challenges for curriculum teaching reform. The integration of AI and education is an inevitable trend, and the application of AI has also injected new vitality into the transformation of blended teaching models. Based on a review of research related to AI and blended teaching, this paper explores the construction path of a blended teaching model under AI conditions. It investigates the AI-enabled blended teaching model from three aspects: creating online courses, conducting course learning, and building an evaluation system. This teaching reform model helps improve learning efficiency and teaching quality, aiming to provide useful references and insights for curriculum teaching reform in universities in the new era.

Keywords: Artificial Intelligence; Blended Teaching Mode; Teaching Reform; Construction Path

1 Introduction

Artificial Intelligence represents another disruptive technological revolution following big data, cloud computing, and the Internet of Things. It achieves higher-level applications by studying how computers can simulate human thought processes and intelligent behavior. The development and application of AI technology have brought huge opportunities and challenges to various sectors of society, while also triggering educational transformations. In teaching and learning, the depth and breadth of AI applications continue to expand, ranging from the selection of teaching content, collection of student learning data, creation of teaching scenarios, classroom interaction between teachers and students, evaluation of learning outcomes, to student academic management and supervision of teacher classroom instruction. AI provides new momentum for informationized teaching reform. Informatized teaching breaks the temporal and spatial limitations of traditional classrooms, giving rise to the blended teaching mode. This model, which combines the advantages of online and offline teaching, conforms to the requirements of informatized teaching. With the development and application of information technologies including AI, the blended teaching mode is also evolving. Re-

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search on AI-empowered blended teaching helps deepen the reform of blended teaching. Teachers need to provide students with broader choices during their learning process, actively promote the blending of online and offline teaching, traditional and new teaching methods, and knowledge-skill teaching with practical application teaching. This aims to create a conducive learning atmosphere integrating context, interaction, experience, and reflection, achieving the comprehensive development of students' overall quality and leveraging their strengths in the AI era[1,2].

2 Artificial Intelligence and Blended Teaching

2.1 Artificial Intelligence

Artificial Intelligence (AI) is the study of how to use machines to simulate human consciousness and thinking. Its main research directions include: machine vision, speech recognition, natural language processing, robotics, etc. The core technologies of AI include neural network technology, big data technology, cloud computing technology, etc., which can be applied in some intelligent educational application systems, such as image recognition, speech recognition, statistics and recognition, reasoning and judgment found in many educational systems. With the development of information technologies like cloud computing, big data, IoT, and the Internet, AI has entered a period of vigorous development. AI technology will serve as a teaching aid for teachers, innovating teaching methods, improving teaching quality, providing learners with personalized and contextualized learning environments, promoting educational transformation, and forming a new blended teaching model with characteristics of the AI era[3].

2.2 Blended Teaching

The blended teaching mode combines the latest information technology means with traditional teaching methods, reforming and innovating teaching method and tools to achieve resource sharing, improve teaching effectiveness, enhance classroom efficiency, and leverage students' principal role. It realizes a new teaching model characterized by active, independent, inquiry-based, and collaborative learning. The blended teaching mode breaks free from the constraints of the traditional classroom by integrating online and offline resources, providing students with a more flexible and personalized learning experience. Under the guidance of AI technology, blended teaching becomes more intelligent. Through intelligent learning platforms, students can access teaching resources anytime and anywhere, no longer bound by time and location. This opportunity for learning at any time enables students to participate more actively in learning, enhancing flexibility and convenience. AI technology also provides more interactive and personalized educational experiences for blended teaching. Through intelligent teaching systems, teachers can better understand students' learning needs and progress, adjusting teaching strategies targetedly. Simultaneously, students can also collaborate through online platforms, sharing learning resources and experiences, enhancing the interactivity and social aspect of learning. The blended teaching mode fully

cultivates students' autonomous learning ability, meeting society's demand for high-level, knowledge-based, and versatile talents[4,5].

Overall, the combination of AI and blended teaching brings new challenges and opportunities to education. Both teachers and students can benefit from this intelligent learning environment, promoting more personalized and flexible education, and laying a solid foundation for cultivating students' comprehensive literacy and innovation capabilities[6].

2.3 The Impact of AI on Blended Teaching

The impact of AI on the blended teaching process is mainly manifested in three aspects. First, data intelligence. The application of AI platforms presents rich and diverse educational resources for course learning, changing the originally dull and tedious state of the course and injecting vitality into it. Relying on systems like intelligent data analysis platforms and intelligent learning status monitoring management, teachers can push various learning resources according to students' different needs, and students can autonomously select corresponding teaching content and activities, ensuring precise teaching by teachers and personalized learning by students. Second, platform automation. AI technology can facilitate the shift of students from passive learning to autonomous, active, and personalized learning. Methods such as online learning, offline teaching, and smart teaching enable on-demand learning across time and space, helping teachers complete tasks like knowledge preview, Q&A, and academic assessment. Teachers can comprehensively optimize the teaching design process, creatively carry out teaching activities, stimulate students' learning enthusiasm, and meet their learning needs to achieve individualized learning services. Third, teaching contextualization. Intelligent perception technology and learning analysis technology help construct educational contexts that match various teaching elements, including students, teachers, learning resources, and the teaching environment. This assists teachers and students in conducting efficient teaching activities, stimulating students' curiosity, enhancing their sense of learning achievement, and cultivating their innovative thinking.

3 The Construction Path of the AI-Enabled Blended Teaching Model

The path for AI to promote the reform of the blended teaching model can be unfolded from two levels. At the online level, it involves effectively building an intelligent online teaching platform, accurately pushing course teaching resources, and scientifically establishing a procedural online teaching management system. At the offline level, it involves transforming the teacher's role from imparting knowledge to organizing and guiding; shifting the student's task from cognitive memorization in the classroom to active cooperative learning; and changing the teacher-student interaction mode from interpersonal interaction to human-computer interaction.

3.1 Creating Online Courses Relying on Teaching Platforms

Select appropriate online learning platforms to enrich teaching resources and build the course's online classroom. Establish a rich online course resource library to collect and organize course learning materials, literature, cases, videos, lesson plans, courseware, etc., facilitating students' autonomous learning and online access. Set up online discussion areas and homework submission systems to promote interaction, feedback, guidance, and supervision between teachers and students. Teachers should conscientiously and promptly answer students' questions and resolve doubts.

3.2 Optimizing the Teaching Mode to Conduct Course Learning

The blended teaching mode can not only help students better understand classroom knowledge but also use online communication methods to solve problems encountered by students, enhancing their problem-solving abilities. During the course implementation process, emphasis should be placed on strengthening activity design before class, improving interaction effectiveness during class, and reinforcing knowledge and skills after class, laying a good foundation for the successful implementation of the blended teaching mode.

Pre-class Arrangements:

Step 1: Teachers scientifically decompose teaching objectives into phased learning tasks and provide high-quality teaching resources, such as pre-class learning guides, unit preview lists, and releasing activity tasks.

Step 2: Guided by the teacher, students independently complete chapter and knowledge point tests offline and feedback learning confusions through the discussion area.

Step 3: Teachers monitor students' self-study situation through the platform. Based on chapter tests and task completion, they summarize students' pre-class learning results, compile the difficult problems feedback by students, and select common problems to create explanatory courseware.

During Class: This is the process of refining pre-class activities and internalizing knowledge. Based on the knowledge points identified from the pre-class tests, teachers answer students' questions with focus and hierarchy. Meanwhile, by carrying out learning activities such as independent inquiry, exchange and cooperation, and skill demonstrations, the goal of transforming knowledge into ability is achieved. The application of operational skills is often intertwined with cognitive learning. When teaching offline, teachers need to pay attention to each student's learning progress and needs at all times, and reorganize and design targeted reviews and guidance for the course's key points, difficulties, and error-prone points.

After Class: This is the transformation of knowledge and skills. Teachers further optimize teaching content, supplement learning materials, assign homework, and design extension tasks based on information gathered from classroom observations and online self-study feedback. Students independently complete tests, practical operations, and extension exercises, further enriching learning content, consolidating learning outcomes, externalizing knowledge and skills, and realizing a competency cultivation

model centered on "transmission - internalization - skill". Throughout the teaching process, through pre-class previews, in-class tests, and post-class exercises, teachers promptly adjust their teaching ideas and methods, forming a dynamic evaluation that integrates management, learning, and teaching, combining motivation, process, and effect into one.

3.3 Building an Evaluation System Combined with Process Assessment

Based on the characteristics of the blended teaching mode, teaching evaluation is no longer solely offline evaluation. Instead, it utilizes data from students' learning processes to conduct formative evaluation of teaching and learning, which is then combined with offline evaluation to ensure fairness, objectivity, and blendedness, fully leveraging the positive incentive role of teaching evaluation on teaching and learning. To test students' learning effect, a diversified and dynamic curriculum assessment and evaluation system adapted to the blended teaching mode has been constructed. The assessment content closely aligns with course objectives, covering knowledge, ability, and quality assessment, and features diversified evaluation methods. It is divided into two parts: formative assessment and summative assessment, emphasizing the evaluation of the learning process, and reflecting the "procedural, diversified, and comprehensive" nature of the assessment[7]. The diversified assessment method combining online and offline elements runs through the entire teaching process, effectively mobilizing students' initiative and participation in learning. Formative evaluation mainly includes classroom tests, written assignments, practical operation assessments, etc., throughout the course learning process. It not only allows students to master professional knowledge and skills but also focuses on cultivating their positive learning attitudes and good study habits, improving their autonomous learning ability, communication skills, collaboration ability, and innovation ability. Summative evaluation uses closed-book exams. Question types include multiple-choice questions, fill-in-the-blank questions, true/false questions, short answer questions, and essay questions. The exam content covers key and difficult points from the teaching process, includes some higher-order questions, has broad coverage, diverse question types, moderate volume, and reasonable difficulty. Summative evaluation can test students' ability to summarize and generalize knowledge, as well as their ability to analyze and solve problems[8].

4 Conclusions

The integration of artificial intelligence and education is a development trend in educational transformation, bringing tremendous innovation and enhancement to teaching model reform. "Teaching has principles, but no fixed methods; the difficulty lies in finding the right method, and the value lies in innovation." The close integration of the two is conducive to continuously expanding learning resources, promoting the reform and implementation of the blended teaching mode, cultivating students' innovative thinking, stimulating their self-driven learning ability, ability to pose and solve problems, practical and collaborative communication skills, achieving the goals of students'

comprehensive development and personalized development. The arrival of the AI era, technological advancements, regional differences, varying qualities of the teaching target, and the dynamic changes in the teaching process all determine that teachers' teaching models must keep pace with the times, dare to develop and innovate, in order to achieve the best teaching effects and thereby improve the quality of talent cultivation[9,10].

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