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Research on Generative Artificial Intelligence Empowering Blended Teaching, Learning, and Evaluation

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Abstract: With the continuous development of modern technology, the application of generative artificial intelligence technology in the field of education is expanding, which has brought a certain impact on traditional teaching. Generative artificial intelligence reshapes the teaching model of colleges and universities by improving students' autonomous learning ability, providing rich teaching resources, and expanding learning paths. Blended teaching is a teaching model integrating online and offline based on modern technology, which provides new ideas for college teaching. Based on this, this paper studies the application of generative artificial intelligence in college blended teaching, expounds its important application value, and puts forward corresponding implementation strategies, so as to provide a reference for college teaching reform and improve teaching effect and students' learning experience.

Keywords: Generative artificial intelligence; Blended teaching; Learning; Evaluation

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1. Introduction

In the context of the intelligent era, the field of education is undergoing profound changes. As a new model integrating online and offline teaching, blended teaching has gradually become an important form of college teaching. At the same time, generative artificial intelligence technology, with its powerful data processing and intelligent interaction capabilities, has increasingly prominent application potential in educational scenarios [1]. At present, college education is faced with challenges such as how to improve students' learning initiative, optimize the allocation of teaching resources, and enhance the pertinence of teaching. The traditional teaching model has certain limitations in dealing with these problems. In this context, exploring generative artificial intelligence empowering blended teaching, learning, and evaluation is of great theoretical and practical significance.

2. Important value of generative artificial intelligence empowering college blended teaching

2.1. Conducive to improving students' autonomous learning ability

In traditional teaching, students learn passively, and their learning initiative is limited. However, with generative artificial intelligence, students can use intelligent teaching assistants to set learning goals before class, and assist students in independently exploring the knowledge content of the course through problem extension in the form of AI + application systems such as Wenxin Yiyan [2]. The personalized learning assistant established based on AI can integrate the key knowledge points of the course, the question bank, and online MOOC resources into an associated knowledge network. Students can select the required content according to their needs and make their own learning progress. At the same time, the system can instantly calculate the weak points of students' knowledge according to their learning data and push corresponding targeted learning tasks, which fully exercise students' active thinking ability and problem-solving ability, and better reflect the initiative of learning [3].

2.2. Conducive to providing rich teaching resources

Generative artificial intelligence breaks the limitations of traditional educational resources and quickly generates various texts and other resources for teaching resources. Teachers can use artificial intelligence to carry out lesson preparation, expand reading materials, produce multimedia resources, and other forms. For scientific theories that are difficult to understand and abstract, AI can help people turn them into virtual environments, animated images, and other ways to make them easier to understand, so as to meet the needs of helping students master knowledge [4]. At the same time, the massive data on the Internet is screened and processed by AI to form a high-quality learning resource library, which gives students the most timely information, expands their learning vision, and meets their personalized learning needs [5].

2.3. Conducive to expanding students' learning paths

In blended learning, students' learning takes place not only in the classroom and textbooks. By analyzing the understanding of the learning process using artificial intelligence, the system can provide students with appropriate personalized learning path tips, such as recommending online courses, seminars, or operational tasks suitable for their learning, which is conducive to the development of students' learning diversity. In addition, interacting with the artificial intelligence system to answer questions can also get rid of the limitations of time and space [6]. For example, in a collaborative learning environment, artificial intelligence can play an auxiliary role in task allocation and collaborative completion evaluation, supporting students to explore new learning methods, from the memory of knowledge points to the development of multi-dimensional learning ability, and helping students establish a more comprehensive and profound networked knowledge experience and skill development system [7].

3. Strategies for generative artificial intelligence to empower blended teaching, learning, and evaluation

3.1. Empowering blended learning and providing personalized learning support

Generative artificial intelligence, with data-driven and intelligent algorithms as the core, builds a multi-level and personalized learning support system to reshape students' learning experience. At present, there are many generative artificial intelligence programs, such as ChatGPT, developed by OpenAI in the United States,

and Wenxin Yiyan and Deepseek, developed in China, which provide strong support for blended teaching in colleges and universities. Before class, teachers can use generative artificial intelligence to build a meta-cognitive theoretical framework, provide personalized learning support for students, and help students clarify their learning goals. Taking Wenxin Yiyan APP as an example, students can deeply study the theme course scope in the system, which can decompose the learning goals in combination with the input content and generate operable subtasks, so as to provide students with personalized preview guides. For example, science and engineering students can go deep into the derivation of complex formulas, and the system can generate step-by-step learning tasks for them, leading students to gradually explore the core knowledge, so as to gradually cultivate students' ability to self-plan learning. In addition to generating answers to questions, the system can also intelligently recommend relevant resources or put forward new, extended questions [8]. Using knowledge graph technology, the system can analyze the knowledge points of the course, extend around the knowledge points, expand the question bank resources and online MOOC content, and then form a dynamic knowledge network. Teachers send the key points of pre-class preview to the class group, and students carry out intelligent generation combined with the content shared by teachers, launch discussions in the group around the learning doubts, and send the problems existing after discussion to Wenxin Yiyan in time for feedback and guidance. Wenxin Yiyan can use algorithms such as Bayesian networks to perceive students' learning status and adjust the difficulty of students' tasks according to Vygotsky's "zone of proximal development" theory [9]. For example, if some students have weak comprehension ability, the system can promote the reading of extended academic documents and open-ended inquiry tasks; if some students have an insufficient foundation, the system can provide phased exercise questions and micro-lecture videos, which are suitable for the learning of students at different stages.

3.2. Empowering blended teaching and intelligently optimizing teaching design

In the blended teaching scenario, generative artificial intelligence can use data mining and intelligent analysis to provide an optimization mechanism for teaching, promoting teaching to change from experience-driven to data-driven, so as to improve teaching effectiveness. In the offline flipped classroom link in class, generative artificial intelligence can combine learning analysis technology to build a precise teaching system and intelligently optimize the teaching design. In practical application, teachers first spot check the students' pre-class preview situation, and select 3 students to report the knowledge points respectively, so as to improve the students' absorption of pre-class knowledge. Or release the QR code of the in-class test in the classroom, let the students scan the code to take the test, and the teacher uses artificial intelligence to generate visual charts according to the statistical analysis data of Wenjuanxing to understand the students' error-prone points and doubts. Or the teacher selects several students to play roles, enter the job work respectively, carry out workplace simulation, and other students observe, guide the students to predict and analyze the problems existing in the job, and use the knowledge learned to solve the actual problems [10]. At the teaching design level, teachers can use generative artificial intelligence technology to introduce teaching resources and design teaching activities that meet the needs of students. By introducing natural language processing technology, generative artificial intelligence can carry out semantic deconstruction and sufficient teaching content, transform each knowledge goal into a ladder-type task, and let students learn knowledge in the process of completing tasks. For example, in vocational scene teaching, the system can generate cases of simulated workplace planning and workplace communication combined with the results of learning situation analysis, automatically match different difficulty levels, and let students carry out knowledge construction through group discussion and role-playing, so as to improve the teaching effect. Artificial intelligence can also

use generative adversarial networks (GAN) to generate diversified teaching cases, enrich classroom teaching materials, and create real problem situations for deep learning [11]. In the teaching process, teachers can use generative artificial intelligence technology to give feedback on students' learning performance. For example, use the intelligent terminal to collect students' classroom participation data, including the correct rate of answers, the number of teacher-student interactions, etc., so as to perceive students' learning status and cognitive load. When it is detected that students are inattentive, the system can send an alarm to the teacher and use the learning algorithm to recommend teaching strategies to the teacher, so that the teacher can adjust the teaching in combination with the data, appropriately introduce interesting micro-lectures, or carry out group mutual learning, so as to improve the teaching effect. With the support of generative artificial intelligence technology, teachers can build a teaching system of "data collection-intelligent analysis-strategy optimization", drive the interaction and communication with students, and promote the internalization of students' knowledge.

3.3. Empowering blended evaluation and improving the teaching evaluation system

Teaching evaluation is an important part of blended teaching, which can form a more specific evaluation of teachers' teaching achievements and students' learning effects, so that teachers and students can recognize their shortcomings and then make targeted improvements. Teachers should pay attention to optimizing teaching evaluation with the help of generative artificial intelligence technology, break through the limitations of traditional teaching evaluation, carry out intelligent evaluation on the whole learning process, and improve the teaching evaluation system. From the perspective of evaluation data capture, generative artificial intelligence realizes the in-depth collection and integration of learning process data. By deploying data tracking modules on online learning platforms and intelligent terminals, the system can record the whole process data of students' online learning in real time, including the viewing time of course videos, the frequency of discussion area speeches, the submission time of homework and the modification track, etc. Using natural language processing technology, the system carries out semantic analysis on the text speeches of students in the discussion area, and extracts dimension indicators such as view innovation and logical rigor; with the help of eye movement tracking and facial expression recognition technology, it captures the attention concentration and emotional fluctuation of students in online learning [12]. The fusion of these multi-modal data provides a rich basis for comprehensively depicting the learning process of students. From the perspective of evaluation indicators, generative artificial intelligence introduces emotional computing and social network analysis methods to transform abstract factors such as learning attitude and collaborative ability into quantifiable indicators. For example, by analyzing the speech content, interaction frequency and role orientation of students in group collaborative learning, the social network analysis algorithm is used to calculate their influence and contribution in the team; based on the emotional analysis model, the language style and emotional tendency of students in learning communication are identified, and their learning enthusiasm and cooperation willingness are evaluated. In addition, the system can also combine learning behavior data to excavate the correlation between non-cognitive factors and learning effects, such as finding the positive relationship between positive learning attitude and knowledge retention rate, so as to provide data support for personalized learning intervention [13].

3.4. Empowering teachers' professional development and cultivating teachers' digital literacy

Teachers are the key force to promote the reform of intelligent teaching, and their digital literacy level largely

affects the application effect of generative artificial intelligence technology. Digital intelligence literacy is a high-level ability system integrating digital literacy and intelligent literacy, which requires teachers to realize the reconstruction of knowledge structure, the innovation of teaching paradigm, and the upgrading of education concept in the education ecology empowered by technology. First, build an immersive learning environment to help teachers' digital intelligence awareness awaken. With the help of virtual simulation technology, the system simulates the intelligent education scene and guides teachers to experience the application efficiency of generative AI in learning situation analysis, homework correction, resource generation, and other areas. For example, through the AI-assisted lesson preparation system, teachers can obtain interdisciplinary integration cases and differentiated teaching schemes in a short time, and intuitively feel the improvement of technology on teaching efficiency [14]. This kind of practical experience urges teachers to break through the cognitive boundary of traditional teaching, actively accept the concept of "data-driven teaching", and form the thinking inertia of using intelligent technology to optimize teaching decisions. Second, generative artificial intelligence provides personalized empowerment solutions. Based on the teacher professional development diagnosis model, the system analyzes the ability shortcomings of teachers in teaching design, classroom implementation, evaluation, feedback, and other links, and recommends suitable technical training courses and practical tasks. For example, for teachers with weak teaching design, the system automatically generates learning paths including AI-assisted outline design, intelligent courseware production, and other modules; for teachers with insufficient classroom management ability, it provides classroom behavior analysis tool tutorials and intelligent grouping strategies. At the same time, teachers can participate in the AI-supported teaching and research community, share teaching data with peers, carry out collaborative lesson preparation, and deepen their technical application ability through the collision of group wisdom. Third, promote teachers to flexibly apply generative artificial intelligence technology. Generative artificial intelligence provides teachers with a panoramic portrait of students' cognitive development and emotional changes through educational big data analysis, prompting teachers to reflect on the limitations of traditional teaching models. For example, based on the learning situation report generated by AI, teachers can gain insight into the influence of students' non-cognitive factors on learning effects, and then adjust teaching strategies to achieve the transformation from "experience-based teaching" to "precision education." In addition, artificial intelligence assists teachers in carrying out educational research, helps teachers explore the theoretical innovation points of the deep integration of technology and education, and helps them form the dialectical thinking of "technology empowers education, and education reshapes technology" [15].

4. Conclusion

To sum up, generative artificial intelligence assisting blended teaching is applied to college teaching, which can not only make up for the shortcomings of traditional teaching, but also point out a new direction for the reform of curriculum teaching and provide a platform for students to continue learning and updating. In the actual application process, teachers should pay attention to using generative artificial intelligence to optimize the teaching process, empower the students' learning process, optimize the teaching evaluation system, and improve their own digital literacy, so as to effectively meet the teaching needs. Teaching reform is a continuous process, and teachers should continue to explore artificial intelligence technology and effectively integrate it into teaching to provide students with a more efficient and intelligent teaching environment.

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References

[1] He ZR, Lian WQ, Mo CS, et al., 2025, Exploration on the Reform of Numerical Control Processing Practice Course under the "Artificial Intelligence + Target Problem Orientation" Blended Teaching. China Equipment Engineering, 2025(7): 14–17.

[2] Li N, 2024, Research on the Development Problems of Teachers in Blended Teaching under the Application of Artificial Intelligence Technology. Journal of Hubei Open Vocational College, 37(9): 152–153 + 156.

[3] Chen SM, Guo N, 2025, Research on the Application of Artificial Intelligence Technology in the Blended Teaching Mode of English Major in Colleges and Universities. English Square, 2025(6): 110–113.

[4] Song LL, 2024, The Realistic Dilemma and Countermeasures of Blended Teaching of Ideological and Political Courses in Colleges and Universities in the AI Era. Journal of Beihua University (Social Sciences Edition), 25(3): 121–125 + 155.

[5] Sheng XC, 2024, Analysis on the Application Practice of Blended Teaching and Flipped Classroom under the Background of Artificial Intelligence Technology—Taking the Frontier Technology Application Course as an Example. Computer Knowledge and Technology, 20(12): 158–161.

[6] Chen YJ, 2025, Research on the Application of Artificial Intelligence in Blended Japanese Teaching. China Journal of Multimedia and Network Teaching (Upper), 2025(1): 37–40.

[7] Nong XA, Qiu YY, 2024, Research on Online and Offline Blended AI Course Teaching Strategies. Modern Vocational Education, 2024(36): 77–84.

[8] Tan FF, 2024, Exploration on the Construction of Blended Teaching in College English under the Background of Artificial Intelligence. Talent Development, 2024(23): 152–154.

[9] Xia L, Xu WC, 2024, Research on the Mixed Teaching Mode of Information Visualization Technology Course under the Background of "Artificial Intelligence +". Vocational Technology, 23(12): 90–95.

[10] Han BJ, 2024, Research on the Practice Approach of Blended Teaching in Continuing Education Based on Artificial Intelligence (AI). Journal of Qiqihar University (Philosophy and Social Sciences Edition), 2024(7): 160–163.

[11] Shang DN, 2024, Blended Teaching Strategies and Applications of Deep Learning Based on Artificial Intelligence. Proceedings of the 2024 Higher Education Development Forum and Ideological and Political Seminar (Volume I), 95–97.

[12] Zeng HY, He FY, Zhu J, et al., 2024, Research on Blended Teaching of Intelligent Perception Technology Course Assisted by "Artificial Intelligence + Education" in the New Engineering Environment. Technology Wind, 2024(19): 46–48.

[13] Zheng YH, Song HT, Yao EL, et al., 2024, Research on the Improvement of Digital Ability under the Mixed

Teaching Mode Based on Artificial Intelligence. Technology and Innovation, 2024(10): 160–162.

[14] Wang X, Wang XY, Cao J, et al., 2024, Research on the Integration of Artificial Intelligence Technology and Computer Professional Teaching Mode under the STEM Concept. Information and Computer (Theoretical Edition), 36(16): 32–34 + 38.

[15] Hu XJ, Zhang L, Gao YL, et al., 2024, Application of Generative Artificial Intelligence Assisted Blended Teaching in the Infection Prevention Teaching of Intradermal Needle Technology for Nursing Interns. Journal of Nursing, 31(18): 21–25.