

Exploring a Blended Teaching Model for General Education Courses in Higher Education Based on Smart Classrooms

Yinju Zhang*

School of Marxism, Beijing Technology and Business University, Beijing 100048, China

*Corresponding Author.

Abstract

General education courses play a vital role in the curriculum of higher education institutions. With the advancement of information and network technology, the implementation of smart classrooms has breathed new life into undergraduate general education courses. These smart classrooms employ digital tools to create a student-centered, teacher-guided blended learning environment. This environment combines offline instruction, practical training, self-directed learning, and online education, resulting in a more scientific approach to teaching, management, and evaluation. This blended model enhances students' engagement, encourages active learning, and improves the effectiveness of general education courses. It also ensures timely delivery of teaching and supports the holistic development of students. By deeply integrating computer technology with undergraduate general education, this innovative approach aims to provide valuable insights for the reform of higher education in Chinese universities.

Keywords: Smart classroom, undergraduate, general education course, teaching model.

1. Introduction

Liberal education, in contrast to specialized education, constitutes a vital component of the higher education system, with related courses referred to as general education courses. These courses hold significant importance within the curriculum of higher education institutions. Evidently, how teachers effectively deliver general education courses and how students proficiently learn them are crucial issues in higher education. However, there is a prevalent phenomenon among undergraduates of undervaluing these courses. In the era of information network technology, the increasing channels through which students can acquire knowledge have exacerbated this issue. Consequently, sparking students' interest in learning and fostering a genuine appreciation for general education courses have become the primary goals of teaching model reform. Thus, transforming undergraduate general education courses into subjects that students both enjoy and benefit from throughout their lives has become the prevailing trend in the reform of teaching models for these courses.

A teaching model serves as a paradigm or plan for constructing school curricula, selecting instructional materials, designing teaching strategies, guiding teachers' activities, reflecting on teaching practices, and assigning and grading student work. The appropriateness of the teaching model employed by educators is directly related to both teaching effectiveness and student learning outcomes. In the era of information network technology, rapid advancements and applications of artificial intelligence and big data have challenged traditional teaching models, propelling higher education towards smarter, technology-enhanced learning environments. Consequently, smart classrooms have emerged. As some scholars have noted, "machines are extensions of the hand", and modern automatic control technologies are "also extensions of the brain". [1] The integration of informatization methods in smart classrooms has revitalized the development of higher education. Therefore, constructing efficient and beneficial teaching models based on smart classrooms has become an urgent issue for undergraduate general education courses in higher education institutions.

Recent academic research has yielded substantial findings on blended teaching models based on smart classrooms. In *An Empirical Research on Cultivating Learner's Creativity in Smart Learning Environment*, Hu et al. analyzed the role of intelligent learning environments and advocated for the establishment of a creativity cultivation model within these environments. [2] Chen's study, *Research on the Design and Application of Wisdom Classroom Teaching Model in the Background of "Internet Plus Education"*, examined teaching objectives, activities, implementation conditions, and evaluations, asserting that smart classroom teaching should foster the generation of student intelligence. [3] Liu et al.'s *Identification of Effective Teaching Behavior Identification in Smart Classroom Based on Behavior Sequence Analysis* argued that smart classrooms, as a tangible manifestation of smart education, greatly facilitate the use of information network technology in teaching. [4] SEVINDIK T's work, *Future's Learning Environments in Health Education: The Effects of Smart Classrooms on the Academic Achievements of the Students at Health College*, noted significant improvements in students' academic performance after teaching in smart classrooms. [5] Shen et al. proposed a smart classroom system that achieved real-time interaction between teachers and students, positively influencing students' attitudes toward learning. [6] Horne et al. concluded that flipped classroom teaching, enhanced by intelligent assisted teaching technologies, effectively increased teacher-student interaction in the classroom. [7]

Based on teaching experience, I believe that constructing a blended teaching model on the foundation of smart classrooms—centered on students, guided by teachers, and integrating offline instruction, practical teaching, self-directed learning, and online learning—is beneficial for students to develop a correct worldview, outlook on life, and values. This approach strengthens the educational and talent cultivation functions of undergraduate general education courses, fosters students' ability to learn proactively, and cultivates a diligent and inquisitive attitude, thereby enhancing the teaching effectiveness of undergraduate general education courses.

2. Objectives

The application of smart classrooms through information technology has infused new vitality into the development of higher education teaching. Consequently, constructing efficient and beneficial specific teaching models based on smart classrooms has become an urgent issue for undergraduate general education courses. This paper aims to explore the construction of teaching models founded on the deep integration of computer technology with undergraduate general education courses. By combining online and offline courses and utilizing smart classroom teaching aids, the study seeks to summarize a blended teaching model that integrates offline instruction, practical teaching, self-directed learning, and online learning. The goal is to provide valuable references for the reform of undergraduate education and teaching in Chinese universities.

3. Methods

This study delves into four key aspects based on the foundation of smart classrooms: offline instruction, practical teaching, self-directed learning, and online learning. Offline instruction encompasses thematic teaching and classroom discussions, while practical teaching is divided into campus-based and social practices. Self-directed learning is discussed from the perspective of teacher-guided autonomous learning by students, and online learning focuses on the interactions and learning exchanges between teachers and students using smart classroom tools.

The research primarily adopts constructivism, situated cognition, and blended learning methodologies. Constructivist learning theory, a human-centered approach, advocates for the role reversal of teachers and students, emphasizing the active role of students. Teachers construct both online and offline learning environments, where students achieve their learning objectives through cooperation with teachers and peers. By applying situated cognition theory, teachers use smart classrooms to create problem-based scenarios and, through practical teaching, provide rich contexts that link history with contemporary realities. The implementation process of the proposed blended teaching model is essentially the process of students engaging in blended learning, where both are intertwined. Blended learning leverages the strengths of different learning methods.

4. Results

Different teaching models have varying impacts on students' learning outcomes and teachers' teaching effectiveness. Constructing a blended teaching model that centers on students and is guided by teachers—

integrating offline instruction, practical teaching, self-directed learning, and online learning—based on smart classrooms, is a multi-level, multi-directional interactive teaching model. This approach achieves educational objectives, meets student needs, and guides students in acquiring and applying knowledge. It fundamentally transforms the traditional knowledge-transmission-focused teaching model into a modern teaching model that emphasizes both theory and practice.

5. Discussion

5.1 Offline instruction

Offline instruction based on smart classrooms primarily includes thematic teaching and classroom discussions. With societal development, traditional indoctrination-style classroom teaching, especially the rigid adherence to textbook chapter sequences, has increasingly failed to engage students. Thematic teaching, in contrast, deviates from conventional methods where teachers follow textbooks chapter by chapter. It involves teachers selecting a few key issues based on the realities of society, students, and textbooks, and teaching around these central issues through different teachers and themes [8]. For instance, in the general undergraduate course “Modern and Contemporary Chinese History” in higher education, thematic teaching involves mastering the textbook content and organizing the course around the central themes and threads of Modern and Contemporary Chinese History. The textbook content is divided into several themes, which are then taught thematically to enhance the effectiveness of the course. Thematic teaching allows for more flexible lesson planning according to the teacher’s expertise and current realities. This approach can address the issue of limited class hours relative to the course content and integrate research closely with teaching, combining cutting-edge research findings with textbook content to plan lessons and improve the course’s academic level. Specifically, undergraduate general education course instructors should design a “chain of problems” strategy under the requirements of the syllabus, approaching the content from different questions or angles. They should systematically summarize and integrate the teaching content, enhancing the specificity, depth, and multi-dimensionality of the material.

Regarding organizing classroom discussions, teachers can either send discussion topics to students via a smart platform before class, urging them to research relevant historical materials, or pose questions through smart tools during lectures to organize student discussions. Teachers should guide students to select certain hot issues from the textbook or history for discussion, sparking students’ critical thinking through the collision of different viewpoints. This enhances students’ abilities to think independently, analyze, and solve problems. Teachers should then comment on the discussion results, explaining confusing points in detail. Moreover, smart classrooms enable teachers to adjust teaching content based on students’ interests highlighted in discussions, optimizing the teaching effect. [9] Students can form groups in advance and prepare for group presentations based on the questions posed by the teacher, combined with their interests. Teachers create a discussion scenario, guiding students to speak actively around the discussion topic, and reasonably control the pace to prevent digressions. Teachers should summarize and comment on students’ speeches, offering praise or pointing out deficiencies, analyzing reasons, and finding solutions. During the organization of classroom discussions and exchanges, teachers can fully display their knowledge, organizational skills, and personal charisma, significantly enhancing their authority, maintaining classroom order, and promoting knowledge dissemination. Meanwhile, students, through collaboration with group members, material research, and discussions, will foster harmonious teacher-student relationships through the exchange of ideas, emotional connections, and mutual understanding.

5.2 Practical teaching

Typically, undergraduate general education courses in higher education are primarily conducted by teachers through classroom instruction. However, in the era of information technology, confining undergraduate general education teaching strictly to classroom lectures makes it challenging to fully achieve the educational goals. Therefore, teachers should combine theoretical instruction with practical teaching to cultivate students’ ability to connect theory with practice, thus fulfilling the objectives of undergraduate general education courses. As some scholars have noted, “Teachers should also emphasize the students’ practical process, using smart teaching platforms to understand their self-learning capabilities and collaborative skills during practical tasks.” [10] In my

view, practical teaching in undergraduate general education courses mainly encompasses two forms: campus-based and social practice.

The campus serves as the primary venue for students' academic and everyday life, closely intertwined with their studies and personal growth. Thus, it can be utilized as a vital platform for practical teaching in general education courses at universities. For instance, in the general education course "Modern and Contemporary Chinese History", teachers can design practical activities related to the subject by collaborating with relevant campus departments and integrating school-wide cultural education initiatives. These activities could include poster exhibitions, speech contests, essay competitions, debates, and history-themed cultural exhibitions, particularly during significant commemorative events. Teachers can also work with student organizations to facilitate these practical educational activities on campus or invite distinguished individuals from various sectors—heroes, role models, outstanding alumni, and others—to share their personal experiences through themed lectures. This approach adds depth and richness to the practical activities, allowing students to immerse themselves in the historical and cultural nourishment, foster intellectual resonance, and learn from exemplary figures in society. This comprehensive presentation of the course's content aims to achieve the educational objectives of campus-based practical teaching in "Modern and Contemporary Chinese History".

Social practice involves students applying theoretical guidance to real-life activities, fostering their qualities of critical thinking and active participation. Social practice "not only enhances students' ability to apply professional knowledge but also broadens their horizons, increases their awareness of societal service, and plays a crucial role in cultivating high-quality, well-rounded individuals". [11] Therefore, the "Modern and Contemporary Chinese History" general education course can effectively combine theoretical and practical teaching. Specifically, teachers can organize students into groups to conduct volunteer service and research activities, encouraging them to venture beyond the campus and engage in community support initiatives. Additionally, teachers can arrange group visits to various locations or allow each group to independently select a site for their investigation, such as factories, villages, memorials, exhibition halls, and museums. Teachers should emphasize the integration of social practice teaching with problem-oriented instructional methods, guiding students to enhance their problem-awareness and design research-worthy social practice projects based on their interests and expertise. Students should prepare detailed research plans for their respective groups in advance, carefully documenting social conditions, gathering information pertinent to their themes, and writing comprehensive research reports during their social practice activities. Teachers should incorporate these research reports into the student evaluation system, assessing students' social practice efforts to encourage active participation. Through these social practice activities, students gain a deeper understanding of the populace, society, nation, and world conditions.

5.3 Self-directed learning

Undergraduate education at universities is not only about imparting knowledge but also, more importantly, about fostering students' ability to independently explore and solve problems. Supporting students in developing habits of self-directed learning does not diminish the essential role of teachers. Teachers are vital in guiding this process. "While imparting foundational knowledge, it is crucial to simultaneously cultivate students' self-directed learning skills. Teachers must fully utilize the benefits of intelligent teaching methods". [12] Teachers should adapt their instructional strategies scientifically, responding to changes in students' learning progress. Emphasizing self-directed learning without sufficient teacher guidance can lead to aimless and disorganized study, even with the aid of intelligent education platforms. This issue arises because many students lack strong self-discipline. Even those with good self-control can encounter challenges in their study methods. Additionally, students may have biases toward certain subjects or lack interest in specific courses. Therefore, teachers must actively monitor and support students throughout their self-directed learning experience, ensuring that they remain engaged and on track.

I believe that students cannot rely solely on themselves in the process of self-directed learning; they require the guidance of teachers to stimulate their thinking. Teachers should use intelligent platforms to clearly communicate key concepts, challenging areas, learning objectives, main study methods, and fundamental theoretical perspectives. It's crucial for teachers to consider the specific characteristics of their students' disciplines, integrating course materials with students' strengths. They should create problem-based scenarios, design thought-

provoking post-class questions, and propose guiding questions to encourage independent thinking. Additionally, teachers should prompt students to develop study plans based on these questions and to preview course content. Teachers should also maintain communication with students after class, responding promptly to their inquiries and addressing difficulties encountered during self-directed learning. They can provide relevant study materials via intelligent platforms, whether related to questions they pose or issues students face in their independent studies. To better facilitate students' self-directed learning, teachers should also encourage, support, and urge students to develop the habit of searching for historical documents or other study materials online. This will stimulate students' awareness of issues and deepen their focus on historical and contemporary social issues. Teachers should motivate students to delve into their studies with questions in mind, guiding them to develop habits of diligent thinking, hands-on practice, innovative thinking, and joyful learning. This will help students connect theory with practice, thereby enhancing their abilities to analyze and solve problems. Some intelligent learning platforms offer diverse services that monitor students' study habits and learning dynamics. Students can annotate and take notes on study content through these platforms, which, in turn, analyze student activities to evaluate their learning behaviors. [13] Clearly, the application of intelligent technology supports the implementation of self-directed learning and provides timely analysis and summaries of students' learning outcomes.

5.4 Online learning

In today's society, the rapid development of information network technology has brought significant changes to educational activities in higher education institutions. The utilization of intelligent teaching platforms by teachers and the engagement of students in online learning through information network technology have emerged as a new model for undergraduate general education courses. Consequently, the "Modern and Contemporary Chinese History" general education course must innovate its teaching methods to meet the evolving needs of contemporary society in the information age. This involves actively integrating the internet, big data, and artificial intelligence technologies to seamlessly combine online and offline teaching. As a result, online teaching for undergraduate general education courses in universities should become an important supplement to offline classroom teaching and an essential component of undergraduate general education.

Teachers should fully leverage the advantages of intelligent teaching platforms, selecting vivid case materials from the information network that closely relate to students' learning and life experiences. This approach provides students with new knowledge and content, broadening their learning and thinking horizons. Teachers should utilize the platform's capabilities for audio, images, and video to present teaching materials and video resources, transforming previously abstract content into more concrete visual forms. This not only alleviates the tedium of course material but also fosters a genuine interest in learning, thereby enhancing students' comprehension and mastery of the course content. Consequently, teachers improve the quality of instruction, and students are more likely to develop good self-directed learning habits, subtly influenced by the rich historical and cultural content.

Teachers can address questions related to the teaching content by setting up online discussions. They can create specific discussion topics around historical hotspots and difficult issues that students are generally concerned about, actively guiding students to think from both theoretical and practical perspectives found in the textbooks. By then organizing free discussions to create a lively atmosphere, teachers can encourage student participation, prompting beneficial insights through both discussions and teacher inquiries. This approach transforms the "Modern and Contemporary Chinese History" general education course from the traditional one-way transmission model to a multi-directional communication model, thereby highlighting the student's central role in the learning process and fostering a habit of proactive learning.

In online learning, students can conveniently consult teachers or others about difficult issues through intelligent teaching tools, while also facilitating the exchange of information among themselves. This interaction helps enhance students' self-directed learning abilities and stimulates their critical thinking skills. Intelligent teaching platforms and auxiliary tools can capture and identify students' learning states through their behavioral data, allowing teachers to easily monitor student progress and provide timely guidance. [14] Consequently, online learning fosters increased interaction between teachers and students, creating a virtuous cycle that effectively enhances both teaching and learning capabilities. For students, online learning emphasizes active participation and their central role in the educational process, thereby sparking greater interest in learning.

6. Conclusion

The emergence and widespread application of smart classrooms aim to achieve educational goals, meet students' needs, and guide them in acquiring and utilizing knowledge by integrating modern information network technology with educational concepts, thus promoting human modernization. Building on the foundation of smart classrooms, the development of a student-centered, teacher-guided blended teaching model that combines offline instruction, practical teaching, self-directed learning, and online learning represents a multi-layered, multi-directional interactive teaching approach. This approach effectively transforms the traditional knowledge transmission-focused teaching model into a modern teaching model that emphasizes both theory and practice. This blended teaching model creates a more scientific system of teaching, management, and evaluation, highlighting the student's central role, fostering a proactive learning interest, enhancing the timeliness of teaching, and contributing to the comprehensive development of students. Consequently, it facilitates the realization of human modernization.

Acknowledgement

Funded by the "R&D Program of Beijing Municipal Education Commission" (SM202210011008); 2023 Beijing Business and Technology University Education and Teaching Reform Research Project (jg235235).

References

- [1] John von Neumann, trans. Gan Ziyu, *The Computer and the Brain*, The Commercial Press, April 2004, p. i.
- [2] Hu Xiaoyong and Zhu Long, *An Empirical Research on Cultivating Learner's Creativity in Smart Learning Environment*, China Educational Technology, no. 6, 2017, pp. 11-16.
- [3] Chen Ting, *Research on the Design and Application of Wisdom Classroom Teaching Model in the Background of "Internet Plus Education"*, Master's thesis, Jiangsu Normal University, 2017.
- [4] Liu Geping, Sun Fan, and Liao Jian, *Effective Teaching Behavior Identification in Smart Classroom Based on Behavior Sequence Analysis*, Modern Educational Technology, no. 6, 2023, pp. 82-91.
- [5] SEVINDIK T. *Future's learning environments in health education: the effects of smart classrooms on the academic achievements of the students at health college*, Telematics & Informatics, Vol. 27, No.3, 2010, pp. 314-322.
- [6] Shen CW, Wu YCJ, Lee TC. *Developing a NFC-equipped smart classroom: effects on attitudes toward computer science*, Computers in Human Behavior, Vol. 30, 2014, pp. 731-738.
- [7] Sam Horne, Cecilia Titiek Murniati, Kem Saichaie, Maggie Jesse, Jean C. Florman, Beth F. Ingram. *Using Qualitative Research to Assess Teaching and Learning in Technology-Infused TILE Classrooms*, New Directions for Teaching & Learning, Volume 2014, Issue 137, 2014, pp17-26.
- [8] Zhou Shuang'e, *Using the Thesis Instruction and Urging the Reformation Of Two-course*, Journal of Ezhou University, vol. 8, no. 2, 2001, p. 36.
- [9] Rohini T, Mohanish G, Siddhesh K, et al. *Internet of things for smart classrooms*, International Research Journal of Engineering and Technology, Vol.3, No.07,2016, pp.203-207.
- [10] Huang Jin, *Research on the "Four-in-One" University Smart Teaching Model*, China Management Informationization, vol. 26, no. 11, 2023, p. 216.
- [11] Hu Yinan, *Research on the Long-term Management and Implementation Strategies of College Students' Social Practice Activities*, Journal of Liaoning Economic Vocational Technological Institute, Journal of Liaoning Economic Management Cadre Institute, no. 3, 2024, p. 124.
- [12] She Lan and Cao Jianping, *Discussion on Improving the Autonomous Learning Ability of Vocational Students through Smart Teaching*, China Economist, no. 9, 2022, p. 197.
- [13] Jae-Kyung Kim, Won-Sung Sohn, Yang Sun Lee. *Advanced Knowledge Sharing Strategies Based on Learning Style Similarity for Smart Education*, Springer Berlin Heidelberg, No.12, 2012, pp141-148.
- [14] Sun Xiang, Luo Jin, Lin Haiying, Feng Qingge, and Liang Yan, *Design and Practice of Smart Teaching Model under the Background of "Internet Plus"*, The Chinese Journal of ICT in Education, no. 10, 2023, p. 98.