

Construction of Ideological and Political Mixed Teaching in Higher Education under the Digital Transformation

Shidong Liang^a, Yinan Zhang^a, Minghui Ma^b, Jianjia He^a, Shengxue He^a

^a Business School, University of Shanghai for Science and Technology, 200093 Shanghai, China

^b School of Mechanical and Automotive Engineering, Shanghai University of Engineering Science, 201620 Shanghai, China

Abstract

This article focuses on the current demands for reform in ideological and political education in higher education, within the context of the digital information and communication era. Specifically, it proposes a plan for integrating ideological and political education into higher education courses using the widely-used blended learning mode in a digitally transformed environment. This plan aims to leverage digital teaching methods, such as the development of multimedia courseware, to enrich classroom teaching content, increase student engagement and learning outcomes, deepen students' understanding and awareness, and enable them to effectively absorb a wealth of information in a limited time. By subtly linking the process of learning professional knowledge with their personal, social, and national development, this plan seeks to foster a professional education philosophy that cultivates "socialist successors."

Keywords: Higher education; Digital construction; Course ideological and political education; Blended teaching.

Analysis of the current teaching situation

The connotation of "curriculum ideological and political education" refers to practical activities of ideological and political education that are based on or aided by professional or general courses. It also encompasses the integration of ideological and political education into the educational practices of these courses. Teachers of professional courses in colleges and universities bear the sacred responsibility of preaching, teaching, and dispelling doubts. Additionally, they have the crucial task of guiding students towards healthy growth. In the current context of digitization and informatization, the demands for emerging industries and new types of talents, such as digitization, artificial intelligence, intelligent manufacturing, robotics, and cloud computing, are rapidly evolving. Therefore, the teaching mode of colleges and universities needs to adopt new rationality, ideas, and actions to meet the needs of the new era's construction and exploration. The integration of ideological and political education in colleges and universities in the context of new digital transformation presents a challenging problem to address while constructing professional courses under the new situation. Developing a construction plan and implementing exploration to tackle this issue is crucial.

Construction of Ideological and Political Mixed Teaching in Higher Education under the Digital Transformation

In the context of digital transformation, this article advocates for a balanced and scientifically-informed mixed approach to education and teaching, centered around the student experience, with a particular focus on integrating ideological and political elements in a gradual and nuanced manner. This approach enables students to engage with course materials in a proactive and meaningful way, encouraging critical thinking and problem-solving skills, and ultimately fostering a sense of autonomous learning initiative that aligns with comprehensive educational objectives.

Ideological and political integration of digital courses

With the extensive promotion of digital and ideological and political education systems in the field of transportation system engineering, the reform of new teaching forms has become an urgent and necessary aspect of high-quality teaching. The goal of higher education teaching is to utilize all available resources to cultivate and enhance students' skills and knowledge reserves. In this context, the ideological and political integration teaching mode of hybrid courses is an innovative approach that combines the advantages of traditional classroom lecturing and personalized learning in digital teaching. By integrating these two teaching methods into an integrated teaching mode, this approach can effectively enhance the depth and breadth of students' mastery of curriculum teaching knowledge.

This article presents a construction plan for the ideological and political integration of higher education courses under digital transformation. The teaching reform plan designed in this article adopts a multi-point and integrated ideological and political teaching method, combining active teaching methods with hybrid teaching methods. The result is a teaching and learning process that effectively integrates both teachers and students, enabling them to achieve true mastery of the curriculum.

Integrating mixed teaching mode into teaching system

The teaching team has proposed a dynamic hybrid teaching model theory and method for professional courses in colleges and universities. The current teaching approach is based on fixed online or offline hybrid models, which does not consider flexible adjustments to dynamic working time series. In this study, transportation system engineering-related courses are used as the research object to construct a dynamic hybrid teaching mode. Project-driven teaching is applied throughout the theoretical and practical teaching process. This method fully integrates the advantages of online and offline teaching and develops a two-level hybrid teaching system, including interactive learning of online knowledge points and offline flipped classrooms where teachers guide students to explore and discuss. Table 1 outlines the determined teaching system.

Table 1 Executive elements of hybrid active teaching mode

Elements	Architecture	Objective
First element	Teaching process design based on multiple directions	Visualization of course knowledge and ideas
Second element	Formulation of online and offline teaching content for mixed teaching	Simplify key and difficult points
Third element	Dynamic mixed teaching model with dynamic group and flipped classroom teaching	Learning process tracking guidance

(1) Teaching process design based on multiple directions

In order to meet the needs of social talents, national talents, and ideological and political construction, the curriculum structure should be optimized at a macro level, and a set of classroom teaching plans with reasonable content, clear context, and ideological and political guidance should be developed.

To achieve this, there are two key steps. Firstly, the ideological and political elements should be integrated into the teaching process in a way that is consistent with the times. This involves reconstructing traditional teaching concepts and ideas from different levels and dimensions. Secondly, in response to the needs of social talents, there should be a focus on strengthening the ability of students majoring in automotive-related fields to apply what they have learned. This can be achieved by guiding students to combine theoretical knowledge with practical operations, reforming traditional teaching concepts, and focusing on improving students' engineering literacy.

(2) Formulation of online and offline teaching content for mixed teaching

The second aspect involves designing a comprehensive learning and teaching plan for a specific knowledge point related to transportation system engineering. The plan should encompass multiple forms, angles, and carriers to allow students to repeatedly learn the same knowledge point at various learning stages. This approach avoids the problem of information loss that may occur during a single teaching session and enhances the professionalism, interest, and accessibility of classroom teaching.

Additionally, this article analyzes the advantages and disadvantages of online and offline teaching modes separately. The aim is to tailor the teaching content to suit the characteristics of each teaching mode, avoiding simple duplication and overlapping of teaching content, increasing the learning burden of students, and maintaining their interest in learning.

To enrich the teaching materials, this program incorporates the latest scientific research findings from teachers and colleagues. This includes the provision of self-made lecture notes and scientific research papers to students. The program encourages students to expand their reading, increase their knowledge, and obtain a deeper and comprehensive understanding of the course content. From a teaching content perspective, this

Construction of Ideological and Political Mixed Teaching in Higher Education under the Digital Transformation

program aims to develop multiple approaches, methods, and dimensions to improve teaching quality and student learning effectiveness under a dynamic mixed teaching mode.

(3) Dynamic mixed teaching model with dynamic group and flipped classroom teaching The third element is to innovate the teaching process by using multi-group division and flipped classrooms as the primary means. By taking into account the constraints of both online and offline classes, and following the principle of "mentoring" among students, student grouping can be dynamically adjusted to improve interaction and communication between students in different teaching modes, and compensate for any differences in teaching content received. Classroom teaching allows teachers to play a leading role in systematically imparting subject knowledge to achieve teaching objectives. In contrast, online learning provides learners at different levels with the ability to choose appropriate content based on their needs. Rich digital learning resources, cognitive tools, and interactive support can be utilized to cultivate learners' exploration spirit and innovation ability.

The hybrid teaching model combines the advantages of both teaching methods and can be student-centered, actively guiding students' enthusiasm for learning, and improving their ability to actively learn. By comparing the advantages and disadvantages of different mixed teaching modes, corresponding teaching modes can be developed for different student groups. Teaching effects can be continuously updated based on various tests during the teaching process, and teaching modes can be dynamically adjusted based on teaching effects to optimize the mixed teaching mode.

Taking into account the unique features of the transportation system engineering course and the total number of enrolled students, we will persist in nurturing students' innovative abilities through course-based projects. Throughout the course instruction, students will be prompted to establish teams and carry out project research associated with the course, with the aim of strengthening their comprehension of the course material and delving into relevant knowledge, thereby elevating their research and innovation competencies. For the current semester's course, students will be given the opportunity to propose their own project topics. An illustration of a course project is presented in Table 2.

Table 2. Course project section information

Group 1	Current status and development trends of intelligent connected vehicle environmental perception systems	Group 2	Current status and development trends of national roadvehicle coordination	Group 3	User requirements and application scenarios for advanced driving assistance systems
Group 4	Study on the current situation and future development trend of connected cars	Group 5	Development and research of intelligent connected vehicle perception systems		

The implementation of a Mixed Teaching Mode Technical Route

The formulation and integration of the teaching content for courses related to transportation system engineering have a high level of attention on the learning process and learning outcomes of undergraduate students. The teaching approach is based on the idea of establishing a well-structured course content system, arranging composite teaching content, exploring dynamic mixed teaching modes, and providing feedback on teaching modes.

The technical route implementation involves four stages. Firstly, considering the national talent demand, training requirements, course ideology, and politics elements, a course content management system is established, and a teaching plan is designated. Secondly, a characteristic processing flow is carried out in teaching content, taking into account knowledge impartation, application ability training, and quality education, among others, while also considering both online and offline teaching structures, strengths, and weaknesses. Thirdly, advanced teaching modes such as small-class teaching and flipped classrooms are combined to achieve dynamic processing of the teaching process, thus establishing a dynamic mixed teaching mode. Finally, comparative analysis is conducted based on the advantages and disadvantages of dynamic and static mixed teaching modes, and feedback is given to correct the teaching process, thereby achieving dynamic improvement and effectiveness enhancement of the teaching mode.

Conclusion

This article proposes a course ideological and political education integration scheme for higher education under digital transformation, which integrates the ideological and political education goals throughout the entire teaching process through blended teaching, project-based learning, and teaching lecture platforms. The investigation indicators used are patriotism, knowledge system construction, scientific spirit, and cultural self-confidence. The degree of understanding and perception of each ideological and political dimension by students during course knowledge learning is used as the standard for different familiarity options to measure students' understanding of ideological and political consciousness in this course. To ensure the effectiveness of the teaching plan and process, team teaching, student supervision, and other forms are adopted to conduct corresponding statistical analysis and follow-up visits on the survey questionnaires of classmates. This enables dynamic adjustments of the teaching plan and process, and updating of teaching content. By combining the digital transformation process of teaching, the course ideological and political education is reflected, extended, and enriched within professional knowledge points. This approach empowers students to change from passive acceptance to active cooperation, and then to active interaction.

Acknowledgments

This research was partly funded by the 2023 Teacher Development Research Project of University of Shanghai for Science and Technology, titled "Exploration of the Construction Plan for the Integration of Ideological and Political Education into Higher Education Curriculum under Digital Transformation." (NO. CFTD2023YB12), and University of Shanghai for Science and Technology Student Innovation Project (NO.

Construction of Ideological and Political Mixed Teaching in Higher Education under the Digital Transformation

SH2023078;XJ2023160), Shanghai University of Engineering Science “Ideological and political courses” construction projects (c202301002)

References

- [1] Qiao Y, Fu H. Study on OBE Teaching Concept in the Context of Deep Learning for the Construction of University Mathematics Microcourses[J]. Computational intelligence and neuroscience, 2022, 2022:6860842.
- [2] Xue D. Research on the mixed teaching of animation theory course in Higher Vocational Education under the information environment[C]// 2021 2nd International Conference on Artificial Intelligence and Education (ICAIE). 0.
- [3] Zhang T. Study on the Mixed English Teaching Model in Higher Vocational Colleges Under the Background of Big Data[J]. Journal of Physics Conference Series, 2021, 1852(3):032013.
- [4] Lampoltshammer T J, Albrecht V, Raith C. Teaching Digital Sustainability in Higher Education from a Transdisciplinary Perspective[J]. Sustainability, 2021, 13. [5] Hs A, Jba B, Rui P. Digital transformation in higher education: the use of communication technologies by students - ScienceDirect[J]. Procedia Computer Science, 2019, 164:123-130.
- [6] Nys J, Content A, Leybaert J. Impact of Language Abilities on Exact and Approximate Number Skills Development: Evidence from Children with Specific Language Impairment. [J]. Journal of Speech Language & Hearing Research Jslhr, 2013, 56(3).
- [7] Aditya B R, Ferdiana R, Kusumawardani S S. Digital Transformation in Higher Education: A Barrier Framework. 2021.
- [8] Guo F L. Talking about the mixed teaching mode under MOOC and traditional higher education[J]. Heilongjiang Science, 2017.
- [9] Chen Y J, Xin Z. Discussion on the Construction of Hierarchical Mixed Teaching Model in College Class under the Background of MOOC[J]. Journal of Jiamusi Vocational Institute, 2018.