

Practice Pathways and Effect Evaluation of Curriculum-Based Political and Civic Education in College English in the Digital Intelligence Era – An Empirical Study Based on Universities in Hubei Province

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ABSTRACT Under the strategic background of the digital intelligence era and the digital transformation of education, curriculum-based political and civic education in college English faces the problem of "two separate entities", and technological application and value guidance have failed to integrate effectively. Using a mixed-methods research approach, this study empirically investigates at Wuhan University of Technology and Hubei University of Science and Technology the efficacy and main reasons for two paths: "systematic construction" and "scenario-based innovation". Furthermore, the research reveals that the deep-seated reason for these practical difficulties lies in the structural conflict between the "efficiency logic" of technological tools and the "immersion logic" of value education. To address this problem, the study builds a "Technology-Pedagogy-Value" (TPV) ternary integration analytical framework to systematically explore the internal mechanism of this conflict in practice for the first time and warn about the ethical risk of the "technological gaze". Finally, the study proposes a triangular support system of teacher development ecology, subject teaching paradigm and smart governance system to resolve the conflict and provide a theoretically deep and practically guiding reference for promoting deep-seated reform in digitally-enabled curriculum-based political and civic education.

INDEX TERMS Digital Intelligence Era; Curriculum-Based Political and Civic Education; English Teaching; Technology-Pedagogy-Value (TPV) Framework; Practice Pathways; Effect Evaluation

I. INTRODUCTION

In light of the "advancing education digitalisation" and the "new liberal arts" policies, college English teaching needs to foster students' cultural confidence and effectively convey China's story through the development of cross-cultural competence. However, the current situation of digital-enabled English curriculum-based political and civic education generally faces the deep-seated problem of a "two-separate-entities" phenomenon. Technological applications generally fall into the category of instrumental efficiency logic and have not been effectively integrated with the objective of value immersion. Therefore, a rigid integration of political and civic factors with language teaching has been adopted, and its educational effectiveness has not been empirically verified. Most of the previous studies have focused on only one part and have not sys-

tematically investigated the "Technology-Pedagogy-Value" (TPV) ternary integration analytical framework in the era of digital intelligence. Even rarer are all-encompassing pathway studies based on this framework that cover the entire process of design, implementation and evaluation.

Therefore, this study aims to tackle the main research problem: How to construct an effective practice path for English curriculum-based political and civic education that integrates digital tools and values guidance seamlessly? How to verify the actual effects of implementation scientifically? Based on the TPV analysis framework, typical practical cases from several universities in Hubei Province were selected for this study, including Wuhan University of Technology (which has formed a "Platform + Resource + Evaluation" system) and Hubei University of Science and Technology (which has conducted scenario-based innova-

tion), and their various ways of addressing the "two separate entities" problem were systematically explored. The three levels of this study are content integration, pedagogical innovation and effect evaluation. Using a combination of quantitative and qualitative research methods, this study aims to expose the structural conflict between the logic of technological efficiency and the logic of value immersion, analyze the internal mechanisms and practical effects of this conflict, and finally offer a theoretical reference and practical paradigm for building a support system to resolve this conflict and drive deep-seated reform in digitally-enabled curriculum-based political and civic education..

II. LITERATURE REVIEW AND THEORETICAL FOUNDATION

A. DEFINITION OF CORE CONCEPTS

"Curriculum-based political and civic education in college English in the digital intelligence era" is operationally defined as values education practice mediated by English courses in an intelligent technological environment. The main features are: use digital technology to build cross-cultural scenarios, combine various kinds of political and civic education materials, offer personalised values, and provide intelligent feedback.

B. REVIEW OF DOMESTIC AND INTERNATIONAL RESEARCH

At first, many scholars across the country had a vague idea of what to study generally; now, many studies have explored practical paths in all areas. Research in the field of foreign languages generally falls into the following two categories:

Some teaching activities that have been suggested by scholars include speeches, writing and translation of political and civic materials. Chongqing University has constructed a "three-stage integration" curriculum system (language foundation, disciplinary empowerment, value guidance) to address global issues with Chinese solutions through project-based learning [1]. Liaoning Technical University proposed a "dual-line, three-integration" model to solve the problem of disunity in political and civic education [2]. Hunan University of Information Technology has been using AI tools and virtual teaching offices to address the issue of rigid integration [3]. Later, CiteSpace and SPSS were employed to uncover more trends, problems and innovative paths for IT-assisted curriculum-based political and civic education in subsequent research [4]. The "online + offline" blended teaching model is a knowledge system for curriculum-oriented political and civic education that offers new ways to integrate knowledge transmission with value education [5]. At the same time, some studies have put forward all-encompassing strategies for building a curriculum-based political and civic education system, optimising teaching paths, sharing practical cases, and strengthening evaluation mechanisms. The above measures aim to solve problems in the era of digital intelligence and improve teaching effectiveness [6].

The promotion and application of the textbook series "Understanding Contemporary China" are to establish an all-encompassing resource system. Research has also focused on how to discover implicit political and civic education resources in textbooks and build thematic case libraries, such as "Excellent Traditional Chinese Culture" and "Contemporary Chinese Achievements".

Although many applications have gradually appeared, most research still considers digital intelligence technology to be only a supporting tool or resource carrier. There is a lack of systematic, theoretically in-depth research on how technology reconstructs the teaching process and teacher-student interaction relationships in "language learning - cultural comparison - value identification" at the level of underlying mechanisms. For instance, how the intervention of generative AI may change traditional translation ethics and the logic of value transmission [7], and how immersive environments created by VR/AR can foster cultural identity more effectively – these deep "mechanism" issues have yet to be explored. Although some studies have begun to explore new models of multimodal teaching to address problems such as information overload and an uneven input of Chinese and foreign cultures [8], there is still a lack of research on the dynamic process and underlying logic of value internalization mediated by technology.

With the progress of the national education digitalisation strategy, research focus has moved from the application of technology (e.g., online platforms) to building a new "digital intelligence political and civic education" ecosystem. Research generally believes that digital technology should promote a paradigm shift in curriculum-based political and civic education from "mechanical superposition" (rigid grafting) to "ecological integration" [9]. For example, create virtual or augmented reality environments for immersive cultural comparisons and have AI agents act as personal growth companions and guides. Systemic reform plans for the era of artificial intelligence have been proposed, such as integrating elements of textbook political and civic education with AI, constructing a "national strategy - regional culture - personal growth" three-level thematic chain, and expanding learning fields through virtual simulation technology [10]. Digital intelligence networks serve as information platforms for integrating all links in the process of political and civic education, and, through data quantification and visual analysis, enhance the transparency of this process [11].

Recently, some scholars have begun to explore the serious problems in practice and accurately identified several prominent bottlenecks at present. These precisely provide a direct problem orientation for this study: "Systemic fragmentation of the digital intelligence ecological chain": There is a problem of data silos, and the links among teaching, management and evaluation in data are not effective, thus failing to form a collaborative education closed loop [12]. Although attempts have been made to integrate resources through projects such as building cloud-shared digital political and civic education teaching resource libraries [13] or public English

curriculum-based political and civic education resource libraries [14], a deep connection between these resources and teaching activities and evaluation data for the construction of a dynamic closed-loop system has yet to be achieved. There is also a "structural imbalance in teacher digital literacy": teachers face the dual challenge of learning how to use technology and designing political and civic education courses, and systematic training and interdisciplinary team support are urgently needed. Some university teaching teams, in the course of project implementation, have added enhancing teachers' capabilities in curriculum-based political and civic education as a required item for the next stage, showing that this problem is widespread and urgent.

Evaluation of the internalisation process of values is not yet scientific and quantitative. Although some research has used learning analytics to generate "digital profiles" or set up a system of "language + values" two-dimensional evaluation standards [15], their validity and scientific rigor still need to be verified by empirical studies. Research at the international conference has examined how digital tools affect students' language skills, cultural awareness and ideological literacy in all aspects, and various evaluation systems have been presented.

In short, the previous studies have achieved several good results in micro-level practices of disciplinary integration and macro-level visions of technology application. However, at the intersection of "digital intelligence technology" and "foreign language curriculum-based political and civic education", a significant theoretical explanatory gap persists: most research has only described "what has been done" or presented normative suggestions for "what should be done". There is a significant deficiency of an all-encompassing analytical instrument that can offer both explanatory and critical capabilities for the internal mechanism (i.e., the 'black box') of how intelligent technology, as a 'structural environment' rather than a neutral tool, systematically mediates and reshapes the 'teaching-value' interactive relationship. The two problems in the current theories are as follows: First, the original systems of Activity Theory and Constructivism are suitable for analysing human-tool cooperation but fail to fully describe the fundamental transformation of teaching relationships that intelligent technology, through embodied and data-driven environments, brings about. Second, teaching model theories such as blended learning focus on the design of the instructional process but lack refined observational and explanatory tools for the complex, implicit generative process of value internalisation.

Therefore, this paper will address the above problem directly. We introduce and seek to develop the "Technology-Pedagogy-Value" (TPV) ternary integration analytical framework. Although it seeks to show the actual "scene", this system aims to provide a whole-picture analytical instrument that can also interpret mechanisms and processes, and forecast risks. This lens is at the intersection of the two cutting-edge academic problems of "technology as a structural context".

and "value as a generative process." By applying this framework to the empirical field of Hubei universities and integrating the CIPP model with multimodal data, this study strives to advance research in this area from "experience summarization" towards a paradigm that "equally emphasizes theoretical interpretation and empirical optimization," thereby providing a more explanatory theoretical basis for solving the "two separate entities" dilemma [16].

C. THEORETICAL FOUNDATIONS OF THE RESEARCH

Constructivist Learning Theory and Situated Learning emphasize the active construction of meaning by subjects in authentic or simulated situations. This provides an epistemological foundation for digitally-enabled political and civic education: the core value of technologies like VR/AR lies in their ability to create high-fidelity "value cognition contexts," enabling students to autonomously construct value meaning from perception to identification through simulated experiences and problem-solving in cross-cultural communication.

Blended Teaching Theory and the "Online-Offline" Education Closed Loop guide the design logic of the teaching process. In digitally-enabled political and civic education, online and offline spaces are no longer simply connected but constitute a "double helix" structure for value guidance: online platforms perceive learning situations through data, push personalized political and civic education resources, achieving large-scale, precise input; offline classrooms focus on in-depth value analysis, emotional resonance, and behavioral guidance, facilitating personalized meaning-making. The two work synergistically to form a closed loop.

CIPP Evaluation Model and "process-outcome" comprehensive evaluation offer a system for effect assessment. The four stages of evaluation (Context, Input, Process, Product) in this study will be used to observe the whole educational chain from strategic alignment to long-term results. Based on this, we will further introduce learning analytics to attempt a data-driven representation and interpretation of the implicit process of value internalisation.

D. THE INTEGRATED ANALYTICAL FRAMEWORK OF THIS STUDY: THE "TECHNOLOGY-PEDAGOGY-VALUE" (TPV) TERNARY INTEGRATION MECHANISM MODEL

Based on the above theories, this paper establishes the "Technology-Pedagogy-Value" (TPV) ternary integration mechanism analytical framework. This framework is a layered, dynamically interactive system model that can explain the internal logic and essential mechanisms of value generation in English curriculum-based political and civic education for the digital intelligence era systematically.

The three parts of this system are linked:

Technology Empowerment Layer (Foundation/Context Layer): The base of the framework, which includes a series of intelligent technologies such as Big Data, artificial intelligence, virtual reality, and so on. Its main function is to organise the basic content of teaching and values. This layer

raises the level of technology from "tool" to "environment", and now these technologies are collectively building a new educational space that is embodied, datafied and ubiquitous. This environment offers new opportunities for immersive experiences, precise feedback and spatiotemporal extension of values education. This indicates that, with the digital transformation of education, we have set a new goal to foster morality in education through the use of cutting-edge technology, such as the Metaverse and ChatGPT.

Pedagogical Transformation Layer (Core Hub Layer):

This is the primary conversion point for technology and values in teaching; teacher-led instructional design activities take place here. Its first purpose is to cleverly transform and unify the goals of abstract political and civic education, language skills, and underlying technological functions into specific, feasible teaching tasks, such as project-based learning, critical discussions, and mirror-image comparative analysis. The first problem is how to convert value elements into students' cognitive experiences based on resource forms; the second is that these entities are not unified.

Value Internalisation Layer (Ultimate Goal Layer): The end goal of the framework is to generate a mechanism for students' internalisation of values. Through good teaching reform, students actively create their own understanding and achieve all-round development of cognition, emotion and behaviour. It is expected that Value internalisation is a relatively complex process at this stage, and therefore, indirect observation and assessment can be conducted through learning analytics of related behaviour and outcome data. At the same time, this layer is also conscious of the risk of the "technological gaze" from the lower layers, and thus seeks to avoid the unconscious discipline of diversity and depth in value reflection by technological logic.

The dynamism of the framework can be seen in the following: Learning behaviour and outcome data generated by the Value Internalisation Layer can be fed back downwards to the Pedagogical Transformation Layer and Technology Empowerment Layer to drive the optimisation of instructional design and the adjustment of technology application models. It forms an unbroken "assessment-feedback-optimisation" closed loop. The risk of a "technological gaze" serves as an external warning signal to continuously scrutinise the process of pedagogical transformation and value assimilation.

Scholarly Value: The TPV framework has extended the traditional idea of technology as a tool or a fixed stage into a dynamic multi-level system and thus provides more all-encompassing explanations. It can determine whether the "two separate entities" problem is due to a lack of infrastructure in the "Technology Empowerment Layer", a flawed design of the "Pedagogical Transformation Layer", or misguided guidance in the "Value Internalization Layer". More significantly, it provides a unified analytical grammar for exploring why different practice paths, such as "systematic construction" and "scenario-based innovation", are effective. As shown in the following detailed case studies,

this framework is not the result of a priori logical deduction but an analytical tool that arises from and requires return to empirical tests; its explanatory power will be demonstrated and verified in actual practice.

III. POLICY CONTEXT AND CURRENT SITUATION ANALYSIS OF CURRICULUM-BASED POLITICAL AND CIVIC EDUCATION IN COLLEGE ENGLISH IN THE DIGITAL INTELLIGENCE ERA

A. NATIONAL STRATEGY AND POLICY ORIENTATION

Under the strong drive of national macro-strategies and educational policies, the new development of curriculum-based political and civic education in college English is taking place. The Policy Environment is relatively rich and structured.

The first purpose of moral education in schools is to cultivate students' moral qualities. The release of the "Guidelines for the Construction of Curriculum-based Political and Civic Education in Higher Education Institutions" indicates that the local exploration has moved to full-scale implementation, and now all universities, all teachers, and all courses bear the responsibility for this education. It offers the foundation for English curriculum-oriented political and civic education.

The national strategy for education digitalisation: The "Ministry of Education Key Work Points for 2022" has clearly put forward the implementation of the education digitalisation strategic action and the construction of the National Smart Education Platform. The report at the 20th National Congress of the Communist Party of China has promoted "advancing education digitalisation", and strategic opportunities and policy guarantees have been provided to use digital intelligence technology to overcome spatial and temporal constraints in the English curriculum-based political and civic education and innovate teaching methods.

The new requirements for cultural confidence and international communication in the present day demand that our country strengthen its capacity for overseas dissemination. As the main window for university students to interact with the outside world and communicate with others, English courses have been given a new task: to use foreign languages to "tell China's story well and promote Chinese culture and values" effectively. This extends the scope of political and civic education from "implicit education" to "explicit competence"

In line with national strategies, Hubei Province's regional policy response has issued a series of regional documents to promote the digital transformation of higher education and the high-quality development of curriculum-based political and civic education. Support universities to build intelligent classrooms and virtual simulation experiment projects, and establish a special research fund for curriculum-based reform of political and civic education teaching. Provide specific project support and an environment for the universities in the province (such as Wuhan University of

Technology, Hubei University of Science and Technology, etc.) to conduct related practices.

B. CURRENT SITUATION AND CHALLENGES OF CURRICULUM-BASED POLITICAL AND CIVIC EDUCATION IN COLLEGE ENGLISH

In accordance with national policies, curriculum-oriented political and civic education in college English at home universities has been broadly introduced; however, it is still in an exploratory and deepening stage and faces a series of universal problems.

Most of the English teachers have been aware of the need for curriculum-based political and civic education and are now intentionally integrating it into their teaching. Some representative integration approaches have been tentatively introduced, such as conducting comparative analyses in explanations of Western culture, selecting English materials that reflect Chinese achievements as teaching content, and organising English discussions around current affairs. Some universities and publishing houses have begun developing English textbooks or online resource libraries that include political and civic content.

Universal problems that have been identified include:

The "Two Separate Entities" phenomenon: political and civic content is rigidly merged with language teaching materials and skill training tasks, resulting in "labeling" or "forced integration" rather than organic unity.

Monotonous Integration Methods: The main types of integration are teacher lectures and text-reading; they lack interactivity, experience, and inquiry, and thus are not very engaging for students.

Difficulty in Evaluation: There are no scientific and practical evaluation tools to assess the effectiveness of teaching at the values level, so there is no basis for improving teaching.

Insufficient Teacher Capacity: Some teachers are reluctant, afraid, or unable to engage in such work because they lack the ability to integrate technology, teaching methods for languages, and objectives of political and civic education.

C. OPPORTUNITIES AND POTENTIAL BROUGHT BY DIGITAL INTELLIGENCE TECHNOLOGY

Digital intelligence technology provides new tools and opportunities to address the above problems and create a new scenario for curriculum-oriented political and civic education in college English. VR/AR technology can be used to build "immersive" cultural experience scenarios, allowing students to feel as if they are "virtually present" at the Dunhuang Caves or the Reform and Opening-up Memorial Hall, and then receive guided tours and explanations in English to make cultural identity education more concrete rather than abstract. AIGC technology can be used to generate cross-cultural dialogues and simulate international public opinion debates, providing students with rich, real-life value-judgment practice scenarios. Smart Teaching Platforms can be used to implement project-based cooperative learning. For example, students work in groups to create an

English digital story collaboratively, "Introducing Intangible Cultural Heritage from My Hometown to the World", and use digital tools to deepen their sense of home and country through language practice. The process data of the platform can record students' collaboration, critical thinking and value selection paths. Learning analytics can monitor changes in students' emotions and values expressed in discussion forum posts, and AI essay scoring systems can identify preliminary value orientations in the text by correcting language errors; thus, they provide teachers with targeted directions for attention. Therefore, the value-guiding force will be data-supported precision rather than "vague intuition".

Based on the analysis of the general policy environment and the development situation of English curriculum-oriented political and civic education in Hubei universities (Chapter III), this paper will investigate the specific application paths and real-world outcomes of digital intelligence technology in this area by adopting typicality and representativeness. Wuhan University of Technology and Hubei University of Science and Technology have been selected as the main cases for a mixed-methods empirical study. The following sections will introduce the particular Design and implementation process of this study.

IV. RESEARCH DESIGN AND METHODS

A. RESEARCH SUBJECTS AND CASE SELECTION

Purposive sampling is used to select two representative universities in Hubei Province as the subjects of this study: Wuhan University of Technology (WHUT) and Hubei University of Science and Technology (HBUST). The reasons for the selection are as follows: Wuhan University of Technology (WHUT) is a national "Double First Class" university at the forefront of research on the deep integration of information technology and education. The construction of curriculum-based political and civic education at this university shows notable characteristics of both "systematization" and "digital intelligence". The university has put forward a work strategy based on the "three strengthenings": "strengthening the construction of a multi-stakeholder collaborative education team, strengthening the construction of a resource system that organically integrates multi-dimensional resources, and strengthening the construction of teaching methods that closely combine various approaches". Together, these form a complete closed loop of concept, mechanism and measure [17]. At the same time, the university has been actively introducing intelligent technology to conduct new research in "AI + political and civic education" and improve both the quality and efficiency of the construction of "grand political and civic education courses" through digital means [18]. Its application focuses on digital infrastructure, such as a "Smart Learning Platform" and a Virtual Simulation Experience Center for Political and Civic Education, and builds an all-encompassing "platform + resource + evaluation" system. Therefore, it serves as a good model for investigating the systematic construction of university curriculum-based political and civic education in

the "digital intelligence era".

The practice at Hubei University of Science and Technology (HBUST) is an innovative path of "contextualisation" and "integration". Its well-designed model of "three-dimensional integration, digital intelligence empowerment" integrates the Life Science Museum with a smart centre, uses MR technology for virtual simulation teaching, and builds an AI political and civic education resource library. Such innovations are based on specific disciplinary contexts and deeply integrate virtual and real environments, providing vivid cases for exploring how digital intelligence technology can create immersive, experiential political and civic education teaching scenarios.

Select the two universities for comparison to examine both the overall construction plan and efficiency of the systematic promotion by a leading university, as well as innovative breakthroughs focused on specific scenarios at a specialised institution. It will provide a rich foundation for all-around exploration of various application paths for curriculum-oriented political and civic education in the era of digital intelligence and expand the generalizability of research results. This interdisciplinary practice of curriculum-based political and civic education is similar to related research in the context of "emerging engineering education" [19].

B. DESIGN AND RELIABILITY/VALIDITY OF THE MIXED METHODS RESEARCH

This study adopts a mixed-methods approach, integrating quantitative and qualitative research to achieve data complementarity and cross-validation of conclusions, comprehensively answering the research questions of "what are the pathways" and "what are the effects."

Questionnaire Survey (Quantitative Research). The questionnaire, designed based on the research framework, consists of four parts:

1. Demographic information;
2. Evaluation of experiences with digital intelligence curriculum-based political and civic education practice pathways (e.g., resource forms, platform usability, teacher application ability);
3. Perceived evaluation of the educational effect of curriculum-based political and civic education (using a five-point Likert scale, covering dimensions such as cognition, emotion, behavioral intention);
4. Open-ended suggestions for improvement. The questionnaire development process followed the standard procedure of "clarifying constructs - generating items - expert validity testing - pre-testing and revision," with its methodology drawing from academic discussions on the standard application of questionnaire survey methods in educational research [20]. A small-scale pre-survey was conducted before formal administration, and SPSS software was used for item analysis and reliability/validity testing. Cronbach's α coefficient was calculated to assess the internal consistency of the scale, with coefficients above 0.7 considered reliable. Exploratory

factor analysis was used to test construct validity, ensuring items effectively measure the theoretical constructs.

Semi-structured Interviews and Case Text Analysis (Qualitative Research): Interviews targeted groups of teachers, with two sets of semi-structured outlines designed. Teacher interviews focused on teaching design, implementation challenges, and personal reflections. Simultaneously, public policy texts, exemplary case reports, news articles, and platform materials from the two universities were systematically collected as objects of analysis. Interview design also drew upon qualitative method applications in similar curriculum-based political and civic education integration studies [21]. The "triangulation method" was adopted, cross-validating information authenticity by comparing interview records, observation notes (e.g., from public classes), and textual materials. All interview recordings were transcribed and anonymized.

This study employs an "explanatory sequential design." First, questionnaires provide broad data, revealing overall effects and trends; then, addressing typical phenomena or contradictory findings identified in the questionnaires, in-depth interviews and case analysis explore underlying reasons and specific processes, allowing quantitative conclusions to be deepened and supplemented by qualitative explanations.

C. DATA COLLECTION AND PROCESSING PROCEDURES

Data collection took place from September to November 2025, and in accordance with academic ethics, all participants voluntarily agreed to participate.

The researcher distributed electronic questionnaires to students at the two universities who had taken the relevant courses before. To improve the response rate, an online questionnaire was distributed through multiple channels first, and then a reminder was sent out via the class social group. A total of 412 Questionnaires were distributed. After excluding the invalid answers, 388 valid questionnaires were collected, and the actual collection rate was 94.2%. SPSS 26.0 software was used for data cleaning, descriptive statistical analysis, reliability and validity analysis, independent samples t-tests, and ANOVA.

At the two universities, 12 teachers (covering arts, sciences, and engineering disciplines) were selected for interviews, each lasting 40-60 minutes. The qualitative analysis software NVivo 12 was used to conduct three-level coding analysis on the transcripts and collected textual materials: first-level open coding (extracting initial concepts from the raw data); second-level axial coding (categorizing initial concepts into themes such as "barriers to technology application" and "need for cross-departmental collaboration"); and third-level selective coding (integrating core categories to form central themes such as "teacher agency in digital and intelligent ideological and political education").

V. IN-DEPTH CASE DESCRIPTION: PRACTICE PATHWAYS OF DIGITAL INTELLIGENCE CURRICULUM-BASED POLITICAL AND CIVIC EDUCATION IN HUBEI UNIVERSITIES

A. WUHAN UNIVERSITY OF TECHNOLOGY: SYSTEMATIC CONSTRUCTION OF "PLATFORM + RESOURCE + EVALUATION"

Based on the practice model of the university, this paper attempts to build a project-based teaching scheme named "Transportation Connects the World · Language Links the World" and provides an operable design example.

WHUT's practice has good top-level design and systems thinking. The three links in this pathway are a digital platform at the bottom, high-quality resources in the middle, and intelligent evaluation at the top.

Creating an Integrated Digital Education Environment.

The university has established an online teaching matrix centred on the "Smart Learning Platform" and built a Virtual Simulation Experience Centre for Political and Civic Education. The centre has developed VR/AR technology to create virtual simulation "golden courses" in "Four History" education and "The Spiritual Pedigree of Chinese Communists", etc. It can effectively "bring the construction scenarios of major national projects" to campus, such as the Hong Kong-Zhuhai-Macao Bridge and the C919 large aircraft, transforming political and civic education from "passive listening" into "immersive experience", and providing a "digital foundation" for this practice pathway.

By deeply Excavating Political and Civic Elements in Professional Courses, the university formulated special plans to classify and excavate political and civic elements from different courses, compiling and publishing "Curriculum-Based Political and Civic Education Case Studies." Its key innovation lies in transforming the university's advantageous disciplinary resources in building materials, construction, transportation, and automotive industries into political and civic education resources. For example, in relevant professional courses, using metaverse and digital twin technologies, scenarios integrating industry and education, like "unmanned factories" and "unmanned docks," are accessed remotely in the classroom. This enables students to gain a profound understanding of the practical connotations of the "manufacturing powerhouse" and "transportation powerhouse" strategies while experiencing cutting-edge technology.

By deeply excavating political and civic elements in professional courses, the university formulated special plans to classify and excavate political and civic elements from various courses, compiled and published "Curriculum-Based Political and Civic Education Case Studies", and made full use of the university's strengths in building materials, construction, transportation and automotive industries to build resources for political and civic education. For example, in relevant professional courses, using metaverse and digital twin technologies, scenarios integrating industry and education, like "unmanned factories" and "unmanned docks," are

accessed remotely in the classroom. Thus, students can learn about the actual contents of the "manufacturing power base" and "transportation power base" strategies and experience advanced technology firsthand.

Example of WHUT's Digitally-Enabled English Curriculum-Based Political and Civic Education Teaching Scheme Based on the above systematic construction, WHUT developed a highly context-specific English curriculum-based political and civic education teaching scheme within its advantageous disciplines. Taking "Academic English (Transportation Engineering Direction)" as an example, the "Transportation Connects the World·Language Links the World" project-based teaching scheme was designed and implemented.

This scheme relies on the university's "Vehicle-Road-Cloud Integration" Future Learning Center and digital twin technology to transform the "transportation powerhouse" strategy into an interactive cross-cultural learning experience. In the teaching implementation: pre-class, students take an immersive tour of the digital twin scene of the Hong Kong-Zhuhai-Macao Bridge through the Political and Civic Education Virtual Simulation Center and learn relevant Chinese-English bilingual knowledge maps on the "Smart Learning Platform"; in-class, smart classrooms are used for "mirror comparison" discussions on major Chinese and foreign projects, and AI writing assistants are used for critical exposition and debate; post-class, student groups collaboratively create an English digital narrative work themed "Bridge to the Future: A Chinese Engineer's Perspective," comprehensively using tools like AIGC for output. Throughout the process, the evaluation system integrates the "Diamond Evaluation Model", with the platform automatically recording learning behavior data. Teachers focus on assessing the project outcomes in terms of depth of technical understanding, effectiveness of value transmission, and appropriateness for cross-cultural communication. This ultimately forms a learning digital profile covering the "knowledge-ability-value" dimensions. This case is a vivid microcosm of the university's "platform + resource + evaluation" system implemented within the English discipline, achieving an elevation from "learning English" to "using English to tell the story of Chinese engineering effectively."

WHUT's practice offers a typical system for illustrating the TPV framework. This case shows that when the "Technology Empowerment Layer" (the digital infrastructure, as shown by the "Smart Learning Platform" and Virtual Simulation Center) is given high priority and systematically built, it will provide strong support for realising large-scale, standardised value guidance. However, a full-fledged technology platform has not automatically generated value. The success of its "Transportation Connects the World" English teaching plan is a strong indicator that the core hub of the "Pedagogical Transformation Layer" is indeed insurmountable. Through carefully designed project-based learning and "mirror comparison" discussions, the grand narrative of the "transportation powerhouse" can be creatively

transformed into language cognition tasks that students actively explore, discuss and express, thus reaching the "Value Internalisation Layer". The university's "AI smart class inspection" and "student profile" systems have tentatively shown the feasibility of a data-driven closed-loop system; that is, data generated in the "Value Internalisation Layer" can be used to provide feedback and optimize both "Pedagogical Transformation" and "Technology Empowerment". This case study indicates that in a systematic manner, the three layers have built-in dependencies, and the design quality of the "Pedagogical Transformation Layer" serves as a primary control variable for the overall effect.

B. HUBEI UNIVERSITY OF SCIENCE AND TECHNOLOGY: SCENARIO-BASED INNOVATION THROUGH "THREE-DIMENSIONAL INTEGRATION, DIGITAL INTELLIGENCE EMPOWERMENT"

HBUST's way is to combine technology, content and space deeply in specific teaching scenarios, which is called "scenario-based innovation".

Connecting Physical Venues and Virtual Spaces. The university integrated physical spaces, such as the Life Science Museum, with a smart teaching centre to create a teaching environment that combines virtual and real elements. Based on the above foundation, MR technology can be employed to allow students to interact with virtual pathological models and ecosystems in the actual site, thereby converting abstract teaching of scientific ethics and life values into concrete, operable embodied experiences.

Using MR and AI to Build Immersive Scenarios. In the "three-dimensional integration" model, MR technology builds high-fidelity, highly interactive virtual experiments and historical scenes, and AI technology creates an intelligent political and civic education resource library that can provide personalised cases, historical materials, and interactive questions according to teaching themes and students' learning situations. Technology is now being used to create a "perceptible, tangible and resonant" spiritual space in a

novel way.

Creating Values in Professional Settings: The core of this innovation is that political and civic education will no longer be a standalone "module" but will be integrated into the context of solving professional problems. For example, in medicine-related courses, students who have "personally" encountered a difficult ethical choice in an MR scenario gain a deeper understanding of the "benevolence of a healer" by doing so than they would from listening to lectures. Such a smooth integration is the high-end form that digitally-enabled curriculum-based political and civic education aims to achieve.

HBUST's path is another case-based coupling mode of the TPV framework. A special feature of this case is that its "Technology Empowerment Layer" (integration of MR technology and physical venues) does not aim for universality but rather to create particular ethical situations with high fidelity and high interaction. In this way, the "Pedagogical Transformation Layer" and the "Technology Empowerment Layer" work together very closely: the concept of teaching design (e.g., the experience of an ethical choice) requires a particular embodied interaction provided by MR technology, and the characteristics of the technology directly determine the main activities of teaching. Therefore, the mode of "Value internalisation" will be different. The understanding of the "benevolence of a healer" is not achieved through repeated sermons but is rather instantaneously and experientially felt by inducing emotions and promoting embodied reflection within a high-immersion "moral simulation" scenario. This case shows that when technology empowerment and pedagogical transformation are closely linked in a particular setting, they can promote a "shortcut" to value creation that differs from the regular way and is more dependent on situational resonance.

C. COMPARATIVE ANALYSIS: CHARACTERISTICS, COMMONALITIES, AND GENERALIZABLE EXPERIENCES OF DIFFERENT PATHWAYS

Comparison Dimension	Wuhan University of Technology (Systematic Construction)	Hubei University of Science and Technology (Scenario-based Innovation)	Common Insights and Generalizable Experiences
Strategic Core	Top-down driven, system-first. Emphasizes mechanism guarantee (three-level responsibility system) and large-scale resource construction.	Scenario-driven, breakthrough-focused. Focuses on characteristic disciplinary scenarios, delving deep to create a demonstrative effect.	Successful practice requires clear strategic positioning, whether through comprehensive rollout or focused deep dives.
Technological Logic	Platform-based, data-driven. Technology used to build infrastructure and evaluation closed loop, supporting large-scale, standardized application.	Immersive, interactive. Technology used to create highly experiential specific teaching contexts, supporting small-scale, in-depth learning.	Technology application must serve teaching goals, avoiding "technology for technology's sake." Both approaches aim to enhance teaching appeal and effectiveness.
Teacher Role	"Executor and Optimizer" within the system, receiving systematic training and relying on platform resources for teaching.	"Designer and Leader" in specific scenarios, deeply involved in context creation and interactive teaching design.	Regardless of the pathway, enhancing teachers' digital literacy and competency in political and civic education teaching is key. Institutions must provide corresponding training and incentives.
Generalizable Experiences	1. Establishing a "Party committee leadership, multi-department collaboration" working mechanism is crucial. 2. Building integrated platforms and high-quality digital resource libraries supports large-scale promotion. 3. Integrating data intelligence into teaching management evaluation enables precise and scientific education.	1. Encourage developing "small and beautiful" immersive political and civic education teaching modules that leverage institutional characteristics and disciplinary features. 2. Interdisciplinary teams (subject teachers + tech experts + political education teachers) are key to developing quality scenario-based courses. 3. Value smart transformation of teaching spaces to provide the physical possibility for blended virtual-real teaching.	The two pathways are not opposed but complementary. Universities can, based on their own conditions, choose an integrated promotion strategy of "systematic construction to build a foundation, scenario-based innovation to create highlights."

VI. EFFECT EVALUATION: FINDINGS BASED ON QUESTIONNAIRE SURVEY AND INTERVIEWS

A. ANALYSIS OF STUDENT COGNITIVE AND AFFECTIVE EFFECTS (QUESTIONNAIRE DATA)

Analysis of the 388 valid questionnaires shows that digital intelligence curriculum-based political and civic education

has achieved good results for the students. The general mean of the education effect scale for students was 3.82. Among the items, "Enhanced identification with national development achievements and technological self-reliance" had the highest mean score (4.05), indicating that political and civic content integrated with major national projects and disciplinary frontiers is most appealing to students; "Deepened understanding of professional ethics and engineering ethics" was next (3.91), suggesting that professional ethics education has been strengthened through contextualized teaching. The two top-rated items by students were "novelty of resource formats" (mean 4.11) and "increased classroom participation" (mean 3.98); thus, digital intelligence technology can make teaching more appealing to students. However, "Closeness of integration between content and professional courses" (mean 3.56) and "Depth of online interaction" (mean 3.47) scored relatively lower and are thus problems to be addressed. Independent samples t-tests showed that science and engineering students scored significantly higher in "identification with a technological powerhouse" than humanities students, and senior students scored significantly higher in "understanding of ethics" than junior students. Therefore, the effect of political and civic education will vary depending on the students' professional backgrounds and stages of learning, and different designs are needed.

B. KEY OBSTACLES IN TEACHING IMPLEMENTATION AND TEACHER/STUDENT EXPERIENCES (INTERVIEW DATA)

Coding analysis of the interview data showed that there were specific problems and deep-seated reasons for the shallow

effects.

Main Obstacles for Teachers: Most teachers (especially older ones) have difficulty using the new technology skillfully and designing teaching plans for political and civic education according to the new requirements; the preparation time required is also relatively long. Some teachers have admitted that they sometimes add political and civic education merely to "use the technology" and thus have been rigidly integrated. How to scientifically evaluate students' changes in intrinsic value identification as a result of digital intelligence political and civic education teaching, rather than only assessing knowledge, is a common problem. Subject teachers often wish for long-term support from Marxist College teachers or educational technology experts, but stable interdisciplinary teaching teams are not easy to establish in practice.

Student Feedback: Students agreed that the first feeling after experiencing VR, MR and other technologies was "shocking", but they also pointed out that if technology application remains only at the level of "newness" without inspiring deep thinking and value exploration, its educational effect will fade over time. They want to learn what it is in actual practice, not just hear a list of items or surveys. They hope technology can better support group cooperation, viewpoint discussion and value co-creation.

C. COMPREHENSIVE EVALUATION BASED ON THE CIPP MODEL

A systematic examination of the practices at the two universities [22] reveals the following:

Evaluation Dimension	Evaluation Content	Research Findings and Conclusions
Context Evaluation	Does it meet the strategic needs of national education digitalization and curriculum-based political education?	Fully aligned. Both universities' practices actively respond to the national education digitalization strategy and are contemporary explorations aimed at implementing the fundamental task of fostering virtue through education.
Input Evaluation	Are the invested resources (platforms, courses, faculty, funding) adequate and reasonable?	Hardware investment is sufficient, but soft resources need strengthening. While platform and hardware construction are advanced, the maturity of teachers' digital intelligence political education competency (as per the development system in 5.4) and the sophistication of discipline-specific teaching design plans (like the English teaching case in 5.1) are increasingly becoming key soft inputs that affect practical effectiveness, complementing hardware and resources.
Process Evaluation	Is the teaching implementation process smooth and effective?	Technology application is widespread, but deep integration needs deepening. Teaching formats have been innovated, but the three-dimensional integration of "technology-content-pedagogy" is still in the exploratory stage, carrying the risk of the "two separate entities" phenomenon. The quality of teacher-student interaction remains a process-related weak point.
Product Evaluation	What are the short-term and long-term educational effects?	Short-term cognitive and affective effects are significant; long-term behavioral transformation and value internalization need tracking. The questionnaire confirmed positive immediate effects. However, the long-term effectiveness of political and civic education requires longer-term follow-up studies and more comprehensive evaluation indicators (e.g., graduate tracking surveys) for verification.

VII. CONCLUSION AND RECOMMENDATIONS
A. CONCLUSION

The first achievement of this study is the construction and verification of an all-encompassing analytical framework (TPV) that can address practical problems, explain the

reasons for pathway differentiation, and warn of system-wide risks simultaneously. Based on the above empirical analysis, strengthening curriculum-based political and civic education in college English for the digital intelligence era is not simply an increase in technology or a modification

of teaching methods. It is, in fact, an organised project that requires the cooperative development of the teacher development ecology, the subject teaching paradigm and the smart governance system.

The core of curriculum-based political and civic education in college English in the era of digital intelligence is a systematic reconstruction of the connection between "language teaching" and "value shaping" through intelligent technology. The original contradiction in the development process was a relatively superficial one of "rigid technology integration" (two separate entities); now, it has become a deeper conflict between the "efficiency logic" of technological tools and the "immersion logic" of value education. The tendency of "three emphases and three neglects" (emphasising technological form over educational content, etc.) shown by this study is a concrete manifestation of this main contradiction in practice. The two effective paths, "systematic construction" and "scenario-based innovation", are in fact different arrangements and strengthening strategies for the various links in the TPV system. The former enhances the foundation and generality of the "Technology Empowerment Layer" to promote large-scale application. The latter focuses on the deep connection between the "Pedagogical Transformation Layer" and the "Technology Empowerment Layer" in specific scenarios as a breakthrough point, aiming for the depth of educational effect. Both indicate that effective Design in the "Pedagogical Transformation Layer" is an unavoidable hub for technology and values. The risk of the "technological gaze" mentioned in the study is, in terms of its theoretical essence, a whole-systemic intrusion of instrumental rationality into the realm of value rationality. In the specific context of English political and civic education, this takes the form of an algorithmically-driven assessment system that may be subtly disciplinary. For example, excessively relying on AIGC for essay polishing or judging the depth of thought solely based on keyword matching may unintentionally lead students to prioritise producing safe but uniform texts that align with algorithmic "preferences". Thus, in the pursuit of technological efficiency, the sincerity, criticism and diversity needed for value expression are gradually eroded. This change may make technology less empowering and more of a "Achilles' heel" that undermines the authenticity of values education; thus, ethical reflection must be incorporated at all levels of application immediately. Beyond specific paths, the long-term development of digital intelligence political and civic education requires the support of a triangular system: firstly, a teacher development ecosystem that targets full-chain competencies in TPV, as presented in section 5.4; secondly, context-specific teaching design plans deeply integrated with disciplines and professions, as shown in the section 5.1 case; and thirdly, a smart evaluation and ethical governance system capable of effectively assessing the complex changes in the "Value Internalisation Layer" and preventing technological alienation. All three are necessary.

B. RESEARCH LIMITATIONS AND FUTURE PROSPECTS

The following are the limitations of this study: The sample is mainly concentrated in universities in Hubei Province, and thus the generalizability of the results has not been tested. It only uses cross-sectional data and does not have a long-term follow-up study of the same group of students. Future research will: Conduct long-term follow-up studies to investigate the actual effects of digital intelligence-based political and civic education on students' values and professional behavior over time; carry out comparative research in different regions and at various types of universities to draw more universal patterns and models; and deepen research on the creative applications and ethical boundaries of "AI-generated content (AIGC)" in curriculum-based political and civic education, such as exploring the feasibility of using large models to generate personalised political and civic education teaching cases or conducting value-guided dialogues. At present, research is being conducted in China on how to use intelligent technologies to develop and teach political and civic education.

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REFERENCES

- [1] C. Chen, Y. Shen, and D. Zhang, "The Reshaping Path of the Discourse Power of Online Ideological and Political Education in Colleges and Universities in the context of Pan-entertainment-An Empirical study based on 926 Samples of Generation Z," *Education Insights*, vol. 3, no. 3, pp. 18–31, 2026. DOI: 10.70088/CCGK5W86.
- [2] Y. Diao and S. Jing, "Deep learning based emotion analysis for personalized teaching feedback in ideological and political education," *Multimedia Systems*, vol. 32, no. 3, pp. 182–182, 2026. DOI: 10.1007/S00530-026-02283-0.
- [3] S. He, "Research on Innovative Paths of Ideological and Political Education Model in Colleges and Universities under the Background of Intelligentization," *Advances in Educational Technology and Psychology*, vol. 10, no. 1, 2026. DOI: 10.23977/AETP.2026.100103.
- [4] C. Huang, "Research on the Strategy of Ideological and Political Education in Universities in the Era of "Internet+"," *The Educational Review, USA*, vol. 10, no. 1, 2026. DOI: 10.26855/ER.2026.01.008.
- [5] C. Ji, W. Dai, and L. Yu, "Research on the Implementation Path and Effect of Ideological and Political Education during "Computer Communication and Networks" under the Blended Teaching Mode," *Education Reform and Development*, vol. 8, no. 2, pp. 314–325, 2026. DOI: 10.26689/ERD.V8I2.14250.
- [6] K. Kou, "Research on the Whole Process of Ideological and Political Education in Vocational Undergraduate Nursing Curriculum from the Perspective of "Three All Education"," *Contemporary Education Frontiers*, vol. 4, no. 1, pp. 161–165, 2026. DOI: 10.18063/CEF.V4I1.1288.
- [7] D. Jiang and H. Tao, "Research on the Integration of Intangible Cultural Heritage and Ideological and Political Education in Universities in the Digital Context," *Adult and Higher Education*, vol. 8, no. 1, 2026. DOI: 10.23977/ADUHE.2026.080103.
- [8] Z. Lei and W. Tanqiu, "Intelligent Teaching of Higher Ideological and Political Education Using Artificial Intelligence," *Journal of Cases on Information Technology (JCIT)*, vol. 28, no. 1, pp. 1–16, 2026. DOI: 10.4018/JCIT.402016.
- [9] G. Li, "Practical Exploration of Strategies for Cultivating Normal University Students' Teaching and Research Ability: A Case Study of Method-

- ology of Ideological and Political Education," *Philosophy & Ideology Research*, vol. 5, no. 1, 2025. DOI: 10.37420/J.PIR.2025.009.
- [10] L. Li and Z. Qing, "Construction of Teaching Effect Evaluation Model of Ideological and Political Education and the Marxism in China Based on Big Data," *International Journal of Information System Modeling and Design (IJISMD)*, vol. 17, no. 1, pp. 1–18, 2026. DOI: 10.4018/IJISMD.404756.
- [11] Y. Li, "Ideological and Political Education in the Digital Era: Challenges and Opportunities in China," *The Development of Humanities and Social Sciences*, vol. 1, no. 5, 2025. DOI: 10.71204/BSWY1V69.
- [12] Y. Liu, "The Advantages and Pathways of Digital Storytelling in Empowering the Integration of the Party's Innovative Theories into Ideological and Political Education in Colleges and Universities," *Journal of Contemporary Educational Research*, vol. 9, no. 11, pp. 70–77, 2025. DOI: 10.26689/JCER.V9I11.12986.
- [13] X. Ma, "Ideological and Political Education for College Students in the New Media Era Current Status, Challenges, and Innovative Approaches," *Exploration of Educational Management*, vol. 4, no. 1, 2026. DOI: 10.12417/3029-2328.26.01.019.
- [14] H. Minyan, "Thinking and Exploration on the construction of College Ideological and Political Education System in the Era of Big Data," *International Educational Research Development*, vol. 3, no. 2, pp. 43–46, 2026. DOI: 10.62022/IERD.ISSN3007-7664.2026.02.015.
- [15] W. Shi, "Exploring the Dilemmas and Paths of Ideological and Political Education Work on the Internet in Colleges and Universities," *Exploration of Educational Management*, vol. 4, no. 1, 2026. DOI: 10.12417/3029-2328.26.01.003.
- [16] J. Tao, E. Wu, and T. Lv, "Research on Ideological and Political Education in Big Data Technology Professional Courses under the Theme of "Focusing on Shipping and Multi-dimensional Collaboration"," *Journal of Education and Educational Research*, vol. 16, no. 1, pp. 16–20, 2025. DOI: 10.54097/78WHD998.
- [17] B. Wang, L. Shu, X. X. Yang, et al., "Reading for Ideological and Political Education: Concept and Practice," *Journal of Contemporary Educational Research*, vol. 9, no. 12, pp. 40–47, 2025. DOI: 10.26689/JCER.V9I12.13332.
- [18] Z. Wang, X. Xie, X. Xu, et al., "The spillover value of ideological and political education in vocational courses: an empirical study based on multi-regional institutions," *Journal of Education and Educational Policy Studies*, vol. 4, no. 2, pp. 92–105, 2026. DOI: 10.54254/3049-7248/2026.32368.
- [19] J. Weiwei and X. Xiaolin, "Research on Innovative Ideas and Countermeasures for Ideological and Political Education in Engineering Courses of Private Colleges and Universities under the Background of New Media," *Journal of Sociology and Education*, vol. 2, no. 1, 2026. DOI: 10.63887/JSE.2026.2.1.21.
- [20] L. Xiaoli, "Exploring Content Innovation and Precision Delivery in Online Ideological and Political Education From a Pluralistic Perspective," *International Journal of Knowledge Management (IJKM)*, vol. 22, no. 1, pp. 1–20, 2026. DOI: 10.4018/IJKM.399058.
- [21] F. Xu, "The Improvement Mode and Integration Practice of Ideological and Political Education Ability of College Counselors in a Cross-Cultural Education Environment," *Journal of Contemporary Educational Research*, vol. 9, no. 12, pp. 390–394, 2025. DOI: 10.26689/JCER.V9I12.13444.
- [22] Z. Yin, "Innovative Teaching Model of Curriculum Ideological and Political Education in Internet of Things Courses in Private Universities," *Education Reform and Development*, vol. 8, no. 1, pp. 249–254, 2026. DOI: 10.26689/ERD.V8I1.13841.
- [23] Y. Zhang, "Exploration of the Ideological and Political Education Model of Modern Chinese Courses Under the Guidance of Cultural Confidence," *Education Reform and Development*, vol. 7, no. 12, pp. 226–233, 2025. DOI: 10.26689/ERD.V7I12.13534.
- [24] S. Zhou and C. Zhang, "Core Research on the Exploration and Practice of Ideological and Political Education in Ancient Chinese History Courses," *Education Journal*, vol. 8, no. 8, 2025. DOI: 10.31058/J.EDU.2025.88021.
- [25] X. Zhou, "Exploration of the Excavation and Integration Pathways of Ideological and Political Education Elements in Badminton Courses in Higher Education Institutions," *Journal of Modern Education and Culture*, vol. 2, no. 8, 2025. DOI: 10.70767/JMEC.V2I8.787.

APPENDIX

Design Ideas for the Student Questionnaire (to Quantify Effects)

This questionnaire aims to assess the receptivity, perceived effects, and behavioral intentions related to digital intelligence curriculum-based political and civic education.

Part I: Basic Information

- Grade: ☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior ☐ Graduate Student
- Major Category: ☐ Science/Engineering ☐ Humanities/Social Sciences ☐ Economics/Management ☐ Other
- Which forms of digital intelligence political and civic education teaching have you encountered? (Multiple choices allowed)
 - ☐ Courses on relevant teaching platforms (e.g., "Smart Learning Platform")
 - ☐ Political and civic education VR/virtual simulation experiments (e.g., "Four History" VR course)
 - ☐ Online live broadcasts/lectures
 - ☐ Online political and civic education content related to campus cultural IP
 - ☐ Other (please specify) _____
 - ☐ Never encountered

Part II: Experience and Evaluation of Practice Pathways (Please rate based on your experience, 1-5 points indicating "Strongly Disagree" to "Strongly Agree")

1. The digital intelligence political and civic education resources provided by the university (e.g., VR courses, online case libraries) are rich in content and novel in format.
2. The relevant teaching platforms are easy to operate and effectively support blended learning before, during, and after class.
3. Teachers are proficient in using these digital tools or resources in the classroom for political and civic education integration.
4. Compared to traditional methods, digital intelligence teaching (e.g., scenario simulations, interactive quizzes) makes political and civic education content easier to understand and remember.
5. This teaching method increases my sense of participation and willingness to interact in class.

Part III: Evaluation of Political and Civic Education Effectiveness (Score 1-5)

1. Enhanced my identification with national development achievements and technological self-reliance (e.g., through cases integrated from the university's advantageous disciplines).
2. Deepened my understanding of professional ethics, engineering ethics (for science/engineering students), or professional social responsibility.
3. Stimulated my willingness to actively follow current affairs and social hotspots and think about them rationally.
4. Gave me a more intuitive feel for excellent traditional Chinese culture and revolutionary culture.
5. (Open-ended question) Please cite one most impressive example of digital intelligence political and civic education teaching and briefly explain how it influenced you.

Semi-structured Interview Outline for Teachers (to Explore Pathways and Mechanisms in Depth)

This outline aims to target teachers in different roles (including instructors and those responsible for relevant work) to gain an in-depth understanding of design motivations, implementation challenges, and mechanism guarantees.

Interview Outline

1. Background and Design:

- In what type of course or work have you attempted or been involved in digital intelligence political and civic education teaching? What main tools or resources (e.g., online platforms, VR) did you use?
- How did you design the relevant teaching activities or work plans?
- What educational goals for political and civic education did you hope to achieve?

2. Implementation and Challenges:

- During implementation or promotion, what main technical, teaching, or collaborative challenges did you encounter? How did you respond to or resolve them?
- How do you evaluate students' actual gains through this method? Alternatively, what effects have you observed in your work that are not achievable with traditional models?

3. Support and Collaboration:

- What support (e.g., training, resources, mechanism guarantees) did you receive from the university or college?
- What experiences or suggestions do you have for promoting cross-college collaboration (e.g., between the Marxism College and professional colleges)?

4. Evaluation and Reflection:

- Based on your existing experience, how do you think a more effective effect evaluation and feedback mechanism should be established?
- What is your most central suggestion for the university to deepen and advance this work?

5. Outlook:

- What do you think is the most characteristic and valuable experience of the university's exploration in this area for wider dissemination?
- Where do you see the key breakthrough points for further deepening development?