THE INFLUENCING FACTORS OF IDEOLOGICAL AND

POLITICAL EDUCATION FOR STUDENTS OF WUHAN

UNIVERSITY OF TECHNOLOGY IN THE CONTEXT OF

ARTIFICIAL INTELLIGENCE

XIANG WEILIN
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THE INFLUENCING FACTORS OF IDEOLOGICAL AND POLITICAL EDUCATION FOR STUDENTS OF WUHAN UNIVERSITY OF TECHNOLOGY IN THE CONTEXT OF ARTIFICIAL INTELLIGENCE

XIANG WEILIN

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Advisor: ....

(Dr. Qiu Chao)

Date: ....25.../.......4........./...2025..

....

（Associate Professor Dr. Jomphong Mongkhonvanit）
Dean, Graduate School of Business

Date…….……/…………./……………

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By:	Xiang Weilin
Degree:	Master of Business Administration
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Advisor: .... *Chao Qiu* ....

(Dr. Qiu Chao)

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ABSTRACT

With the global trend of integrating artificial intelligence (AI) into education, AI enhances ideological and political education in universities, supported by national strategies and policies promoting educational innovation through technology. The purpose of this study was to explore the impact of technology support, teachers' digital literacy and student motivation on the effectiveness of ideological and political education for survey students at Wuhan University of Technology.

This study adopted the quantitative research method. A total of 400 questionnaires were distributed. The research team conducted rigorous data reviews to exclude invalid questionnaires with incomplete or inconsistent responses. Ultimately, 303 valid questionnaires resulted in an effective response rate of 75.75%. This study found that technology support, teachers' digital literacy and student motivation positively impact the effectiveness of ideological and political education for students at Wuhan University of Technology. From the findings, the following suggestions are put forward: (1) Strengthening technological support and building platform; (2) Enhancing teachers' digital literacy and promoting technology; (3) Enhancing students' learning motivation and creating intelligent interactive classrooms.

Keywords: ideological and political education, artificial intelligence, Wuhan University of Technology
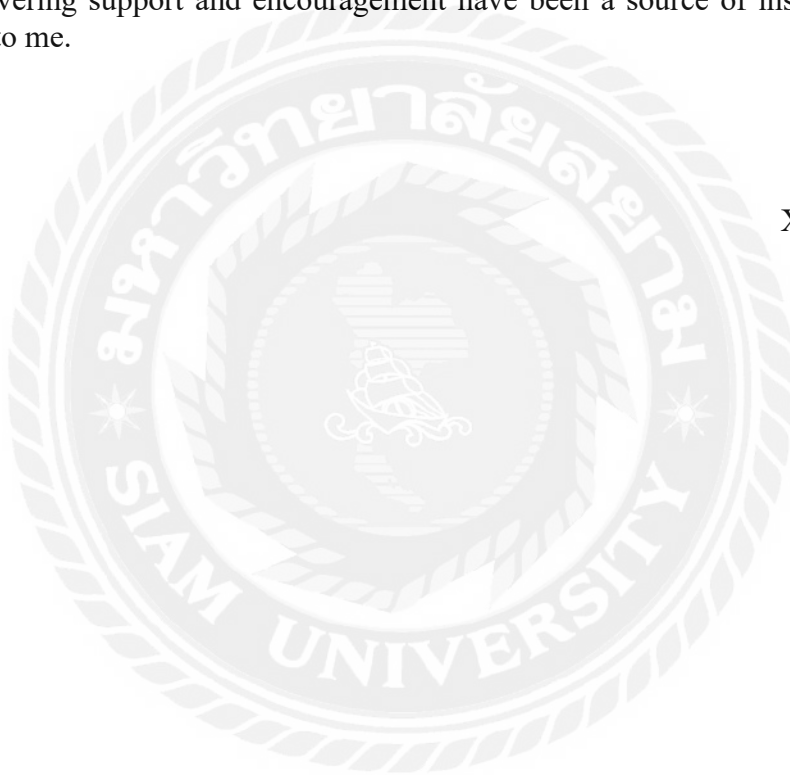
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DECLARATION

I, Xiang Weilin, hereby certify that the work embodied in this independent study entitled *"The Influencing Factors of Ideological and Political Education for Students of Wuhan University of Technology in the Context of Artificial Intelligence"* is result of original research and has not been submitted for a higher degree to any other university or institution.
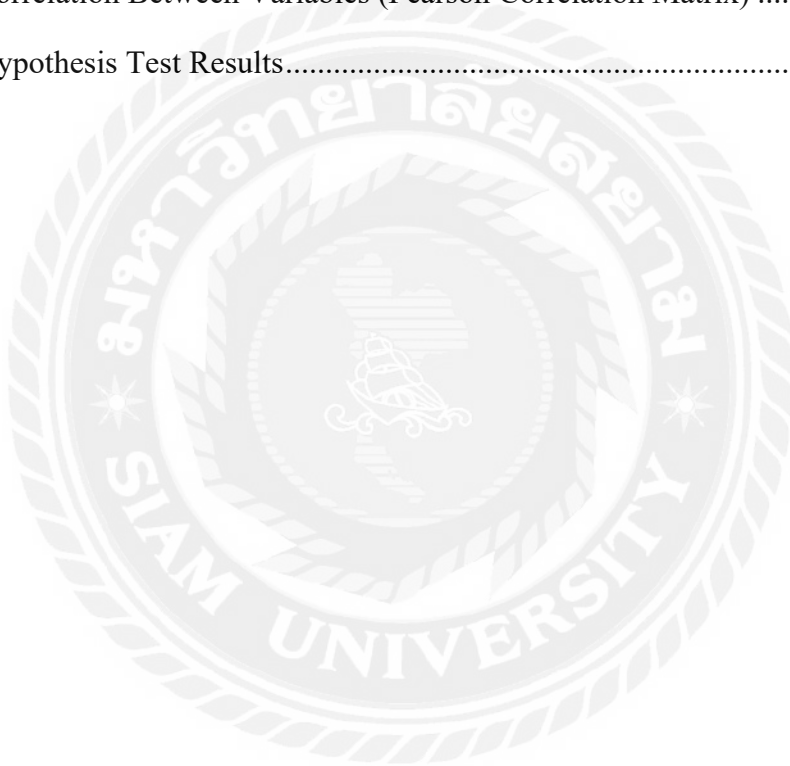
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Chapter 1 Introduction

1.1 Background of the Study

As the wave of the intelligent revolution sweeps across the globe, a suite of cutting-edge scientific technologies centered on artificial intelligence (AI) is catalyzing transformative changes across diverse domains (Allam & Dhunny, 2019). These changes are not only propelling social development and progress to unprecedented depths but also continually expanding their application scope, gradually permeating every facet of society, with education being no exception (Rudin, 2019). To gain a foothold in the impending wave of the intelligent revolution, nations worldwide are vying for prominence in sectors like the robotics industry, prompting the unveiling of numerous strategic blueprints. Notably, the United States issued the strategic report "Preparing for the Future of Artificial Intelligence" in 2016, followed by the European Union's " (Barredo Arrieta et al., 2020). Additionally, countries such as the United Kingdom, Japan, and South Korea have successively rolled out their respective AI development strategies.

There is a growing consensus among nations that AI will emerge as a pivotal force driving future educational transformation and advancement, prompting the introduction of tailored AI development strategies. China aligns with this global trend. During the National Conference on Ideological and Political Work in Higher Education in late 2016, the Chinese government emphasized the importance of adapting to the times and tailoring approaches according to circumstances (Haenlein & Kaplan, 2019), advocating for the integration of information technology and emerging technologies to foster innovation in ideological and political work. Furthermore, in his congratulatory message to the International Conference on Artificial Intelligence and Education in 2019, the Chinese government called for actively fostering the deep integration of AI and education to propel educational transformation and innovation (Langley, 2019).

In pursuit of this objective, China has issued numerous relevant strategies and plans, particularly the "New Generation Artificial Intelligence Development Plan." This plan underscores the urgency of accelerating the profound application of AI in education and leveraging this technology to spark innovation in teaching and training (Chen et al., 2020; Nouri, 2019). It also elucidates the necessity of undertaking platform development, system establishment, and other pertinent strategic planning endeavors. These speeches and documents impart practical significance to the research on ideological and political education among college students against the backdrop of AI, from the policy perspective of the Party and the state (Renz et al., 2020). Moreover, these directives for achieving the integration and development of AI and education constitute vital theoretical underpinnings for conducting this research.

1.2 Questions of the Study

The following research questions are posed in this study:

(1) Does technology support impact the ideological and political education for students at Wuhan University of Technology?

(2) Does teachers' digital literacy impact the ideological and political education for students at Wuhan University of Technology?

(3) Does student motivation impact the ideological and political education for students at Wuhan University of Technology?

1.3 Objectives of the Study

This study presents a comprehensive and systematic exploration of students' ideological and political education in the context of artificial intelligence. Through extensive literature review and questionnaire surveys, it first examined the theoretical foundations and unique value of this research area. It investigated the current status of ideological and political education among students, highlighting the positive impacts of AI. The study identified challenges in integrating AI into this education and analyzed their underlying causes. Finally, it proposed practical pathways to enhance the scientific and intelligent development of ideological and political education, focusing on creating a smart campus environment, optimizing the teaching staff structure, cultivating students' comprehensive qualities, and innovating educational models. These strategies aim to better adapt to the demands of the new era and provide robust support for nurturing well-rounded socialist builders and successors. The specific research objectives are as follows:

(1) To explore the impact of technology support on the effectiveness of ideological and political education for students at Wuhan University of Technology.

(2) To explore the impact of teachers' digital literacy on the effectiveness of ideological and political education for students at Wuhan University of Technology.

(3) To explore the impact of student motivation on the effectiveness of ideological and political education for students at Wuhan University of Technology.

1.4 Scope of the Study

The scope of this study primarily targeted students at Wuhan University of Technology. It did not cover other regions or other types of universities, thus possessing

regional limitations. The research subjects were students from Wuhan University of Technology who have already received ideological and political education. These students have a profound understanding of ideological and political education and are capable of providing reasonable evaluations of it. Participants were able to offer unique insights based on their learning experiences to ensure that the collected data were highly reliable and representative. The research framework included intelligent technology support, teachers' digital literacy, and students' learning motivation.

1.5 Significance of the Study

1.5.1 Theoretical Significance

The research on the integration of artificial intelligence (AI) and ideological and political education holds significant theoretical importance. Firstly, the innovation and development of ideological and political education require continuous absorption and integration of beneficial elements from other disciplines. Introducing AI into this field can inject new vitality into the education of college students, promoting the renewal and upgrade of its content and form. This also helps enrich and develop the theoretical system of ideological and political education, leading to further theoretical enrichment and improvement. Secondly, with the development of the times, the intellectualization of ideological and political education has become an irreversible trend. By exploring the internal demands and application prospects of AI in this field, analyzing its achievements and challenges, and proposing feasible practical paths and coping strategies, this research lays a solid theoretical foundation for the intelligent development of ideological and political education in universities. This, in turn, provides new theoretical support and promotes higher-quality development of ideological and political education in the context of the new era.

1.5.2 Practical Significance

Conducting ideological and political education under the AI integration has profound practical significance. Firstly, this research deeply explores the achievements and challenges of AI in ideological and political education, providing scientific guidance and suggestions for its implementation. It helps educators better leverage the advantages of AI while avoiding and addressing potential risks and challenges. Secondly, the research proposes specific practical paths to enhance the effectiveness of ideological and political education through creating a campus environment, optimizing the teaching staff structure, focusing on students' comprehensive quality cultivation, and innovating teaching models. These pathways aim to build a more intelligent and refined ideological and political education system, thereby improving the overall level of education. Thirdly, the research emphasizes that AI integration should address problems and drawbacks in traditional education methods. By integrating AI,

ideological and political education can achieve greater power and innovation, meeting the talent cultivation needs of the new era and laying a solid foundation for nurturing individuals with innovative spirit and practical ability.

1.6 Definition of Key Terms

Technology support refers to intelligent technologies and digital tools within the educational environment which enhance the delivery and management of ideological and political education. It includes hardware and software solutions that enable personalized learning, real-time feedback, and data-driven decision-making to support educational goals.

Teachers' digital literacy encompasses the knowledge and skills to effectively use digital technologies and AI tools in ideological and political education. It involves the ability to integrate technology into teaching practices, analyze data, and foster an inclusive learning environment to enhance student engagement and outcomes.

Student motivation refers to the internal and external factors that drive students' engagement and persistence in the learning process of ideological and political education. It includes intrinsic interest and extrinsic incentives that influence their willingness to participate actively and achieve learning objectives, especially in AI-enhanced learning experiences.

Ideological and political education is a systematic educational activity aimed at cultivating students' ideological awareness, political literacy, and moral values in alignment with core socialist values. This study focuses on how AI technologies can enhance the effectiveness and relevance of this education among college students to prepare them as well-rounded individuals for society.

Chapter 2 Literature Review

2.1 Introduction

This study aims to identify the influencing factors of the implementation pathways of ideological and political education among college students at Wuhan University of Technology in the context of artificial intelligence. The literature review elaborates on relevant research concerning technology support, teachers' digital literacy, and student motivation. Based on the relationships among these variables, a conceptual model is constructed to determine the influence of each factor on the implementation pathways of ideological and political education for college students at Wuhan University of Technology in the context of artificial intelligence.

2.2 Literature Review

2.2.1 Technology Support

The definition of intelligent technology support varies across different fields and application scenarios. The core concept is to utilize advanced information technology means, such as artificial intelligence, big data, and the Internet of Things, to optimize and enhance the educational process. Intelligent technology support can be defined as a comprehensive technological system that is based on the research findings of multiple disciplines, including computer science, cybernetics, information science, and neuropsychology (Pereira et al., 2018). It aims to empower the educational process through the simulation of human-intelligent activities. In education, the purpose of intelligent technology support is to improve educational performance, optimize the teaching process, and promote student learning through intelligent educational tools and platforms (Pereira et al., 2018; Zawacki-Richter et al., 2019).

The application of intelligent technology support in education is reflected in the development and application of intelligent educational tools, the digital transformation of educational scenarios, and the key technological fields of intelligent technology. Intelligent educational tools are the key focal points for empowering education through intelligent technology (Zawacki-Richter et al., 2019). The characteristics of intelligent educational tools include intelligence, openness, sharing, ubiquity, and interactivity. These tools can provide personalized learning paths and resources through big data analysis and artificial intelligence algorithms while offering real-time feedback and decision-making support. Intelligent technology support has driven the digital transformation of educational scenarios, including learning, teaching, management, and evaluation (Bahroun et al., 2023). Intelligent technology support involves several key technological fields, such as machine learning, natural language processing, knowledge graphs, and data mining. These technologies collectively form the core capabilities of

intelligent technology support, enabling its effective application in educational scenarios. The definition and application of intelligent technology support in education have gradually become clear (Yu & Guo, 2023). It provides intelligent solutions for the educational process through various technological means, promoting digital transformation and personalized education.

In the context of artificial intelligence, intelligent technology support has become an important influencing factor in the implementation pathways of ideological and political education for college students (Yu & Guo, 2023). With the rapid development of technology, its application in education has gradually deepened, bringing new opportunities and challenges to ideological and political education. Intelligent technology support has an impact on ideological and political education through various means (Bahroun et al., 2023). It provides more precise and personalized teaching methods for ideological and political education. Through big data analysis and artificial intelligence algorithms, educators can gain in-depth insights into students' learning behaviors, interests, and knowledge mastery, thereby customizing learning content and teaching strategies for each student (Bahroun et al., 2023; Yu & Guo, 2023). Intelligent learning systems can identify students' learning difficulties and interests based on their online learning behaviors, such as browsing time, interaction frequency, and test scores, and provide personalized learning suggestions and resources. This approach enhances students' interest and engagement in learning and strengthens the relevance and effectiveness of ideological and political education.

Intelligent technology support has also driven the digital transformation of ideological and political education. With the help of artificial intelligence technology, ideological and political education can break through the limitations of traditional teaching models, achieving dynamic updates of teaching content and innovations in teaching methods (Morrow et al., 2023). Virtual reality (VR) and augmented reality (AR) technologies can create immersive learning environments for students, making abstract theoretical knowledge more intuitive and vivid. Intelligent educational platforms can also integrate teaching resources, offering various learning formats such as online discussions and interactive tests to enhance students' learning experiences. Intelligent technology support has optimized the management and evaluation systems of education (Dai, 2021). Through intelligent analysis tools, educators can monitor students' learning progress and performance in real time and adjust teaching strategies promptly. Teachers can understand students' feedback and attitudes towards ideological and political education by analyzing their learning data on intelligent educational platforms, thereby better guiding students' thinking and discussions (Dai, 2021). This data-driven teaching approach enhances the scientific nature and precision of education and provides decision-making support for educational managers.

Intelligent technology support in ideological and political education also faces some challenges. Some educators lack digital literacy in artificial intelligence technology, which leads to difficulties. The application of intelligent educational tools

still needs to be further improved to ensure that functions and effectiveness meet educational needs. Intelligent technology support provides new pathways and methods for ideological and political education for college students (Veselov et al., 2021). Its characteristics of precision, personalization, and digitalization make it a force in promoting the innovative development of ideological and political education. However, educators need to continuously improve their digital literacy and strengthen the development and application of intelligent educational tools to fully leverage the role of intelligent technology support in ideological and political education (Bahroun et al., 2023; Veselov et al., 2021; Yu & Guo, 2023).

2.2.2 Teachers' Digital Literacy

Teachers' digital literacy refers to the awareness, capabilities, and responsibilities teachers possess to appropriately utilize digital technologies for acquiring, processing, using, managing, and evaluating digital information and resources. It also involves identifying, analyzing, and solving educational problems, and optimizing, innovating, and transforming educational activities (Sánchez-Cruzado et al., 2021). This definition encompasses the basic literacy and skills required for teachers to conduct educational activities in a digital environment and is a crucial foundation for adapting to digital education reform (Falloon, 2020; Sánchez-Cruzado et al., 2021).

Teachers need to recognize the value of digital technology in education and its potential risks. They should also demonstrate a proactive attitude in addressing digital education challenges (Falloon, 2020). Teachers are expected to master the concepts and principles of common digital technologies, as well as the application methods of digital resources, including strategies for resource selection, acquisition, management, and evaluation. Additionally, they must be capable of using digital resources to conduct educational activities, including digital teaching design, implementation, assessment, and collaborative education. In digital activities, teachers should comply with relevant laws, regulations, and ethical norms, focus on data security, and maintain a positive online environment (Güneş & Bahçivan, 2018). They should also use digital resources to promote the community's professional development through digital learning, research, and innovative teaching practices. Teachers' digital literacy is a fundamental ability for adapting to digital teaching and an essential support for advancing educational modernization and building a strong educational nation.

As an important influencing factor in ideological and political education for college students, the significance of teachers' digital literacy is increasingly highlighted in the context of digital education transformation (Quaicoe & Pata, 2020). Teachers' digital literacy affects the transmission of teaching content and the innovation of teaching methods should and directly impact the quality and effectiveness of ideological and political education. In the rapidly developing context of artificial intelligence and digital technologies, ideological and political education leverages

digital technology to enhance its appeal and effectiveness. Teachers, as the main leaders in education, directly influence the application of intelligent technologies in teaching activities. For example, Wuhan University of Technology has constructed a "knowledge + data" dual-driven intelligent course platform to strengthen the management of the learning process and create a more connected, open, and precise teaching environment (Çetin, 2021). Teachers should possess data-driven teaching design capabilities and the ability to organize and evaluate teaching activities using intelligent tools.

Improving teachers' digital literacy helps optimize the teaching model of ideological and political education. In the digital age, it is necessary to break the temporal and spatial limitations of traditional classrooms through blended online teaching and flipped classroom models, thereby enhancing students' participation and self-learning abilities (Çetin, 2021; Marnita et al., 2023). Teachers should master relevant digital technologies, such as virtual reality (VR) and augmented reality (AR), to create immersive teaching environments and enhance ideological and political education. Enhancing teachers' digital literacy can also increase the relevance and personalization of ideological and political education (Marnita et al., 2023). Through big data analysis and artificial intelligence, teachers can accurately grasp students' ideological trends and learning needs, thereby developing personalized teaching plans. Establishing evaluation criteria and assessment systems for teachers' digital literacy, conducting dynamic monitoring, and incorporating these into teacher performance evaluations can drive continuous improvement of digital literacy (Marnita et al., 2023).

Improving teachers' digital literacy is of significance for innovating the evaluation system of ideological and political education. With the help of intelligent technologies, teachers can achieve real-time monitoring and dynamic evaluation of the teaching process and students' learning outcomes, providing a more scientific and comprehensive basis for evaluating ideological and political education (List, 2019; Marnita et al., 2023). This data-driven evaluation approach can effectively enhance the quality and effectiveness of ideological and political education (List, 2019). Teachers' digital literacy is an essential foundation for promoting the digital transformation of ideological and political education for college students, optimizing teaching models, increasing relevance, and innovating evaluation systems.

2.2.3 Student Motivation

In the context of artificial intelligence, student motivation has emerged as a significant influencing factor in ideological and political education for college students, with its role and significance increasingly highlighted in practical applications (Hmoud et al., 2024). Student motivation affects the enthusiasm and proactivity of students in participating in ideological and political education and determines the sustainability and depth of educational outcomes. In recent years, research has explored the connotation,

influencing factors, and role of student motivation in ideological and political education from multiple perspectives (Hmoud et al., 2024).

Student motivation refers to the driving force that propels student activities during the learning process. It is a dynamic system composed of learning interest, motivation, emotions, willpower, and other factors (Almaiah et al., 2022). These elements interact to stimulate students' learning behaviors and maintain the continuity of their learning activities. In ideological and political education, student motivation plays a particularly crucial role. This type of education aims to convey knowledge and values, and it requires the activation of students' intrinsic motivation to engage them actively in the educational process, thereby fostering their ability for self-education and self-improvement (Almaiah et al., 2022; Ebadi & Amini, 2022).

The impact of student motivation on the implementation pathways of ideological and political education is reflected in the following aspects (Ebadi & Amini, 2022). The strength of student motivation directly affects participation and effectiveness in ideological and political education (Jin et al., 2023). Research indicates that the stronger a student's learning motivation, the higher their sense of self-efficacy and interest in learning. In ideological and political education, this motivation can encourage students to think critically and apply the educational content proactively, thereby enhancing the practical effectiveness of education (Jin et al., 2023; Sun, 2021).

Student motivation requires a combination of various factors, including school resources, family support, and teacher guidance. These elements collectively provide a favorable external environment for ideological and political education, further enhancing students' learning motivation (Sun, 2021). For example, schools can improve their curriculum systems, provide rich learning resources, and create a positive learning atmosphere to stimulate student motivation. The formation of student motivation is also closely related to students' psychological characteristics and behavioral habits (Azevedo et al., 2022). Research shows that college students' learning motivation is influenced by self-motivation, normative forces, learning habits, and self-control (Azevedo et al., 2022; Yue et al., 2022). In ideological and political education, teachers can help students develop good learning habits and self-management abilities by guiding them to establish correct worldviews and values, thereby enhancing their learning motivation. Additionally, family support and encouragement are factors in stimulating student learning motivation. Parents' care and supervision can help students set correct learning goals and strengthen their motivation (Yue et al., 2022).

As a significant influencing factor in ideological and political education for college students, student motivation plays a role throughout the entire educational process (Fatih et al., 2024). Activating student learning motivation requires optimizing the external environment paying attention to students' intrinsic needs and psychological characteristics. Through multifaceted efforts, student learning motivation can be

effectively enhanced, promoting the high-quality development of ideological and political education.

2.2.4 Artificial Intelligence

In China, research and exploration in artificial intelligence (AI) started relatively late, only beginning to develop gradually in the early 1980s under the advocacy and promotion of scientists like Qian Xuesen (Yue et al., 2022). As time progressed, a series of noteworthy AI technologies, such as AlphaGo, machine translation, autonomous driving, and virtual and augmented reality (VR and AR), have entered the public eye and gradually become the focus of international attention. The rapid development and widespread application of these technologies demonstrate the enormous potential of AI to have profound impacts on human society (Fatih K et al., 2024). To support and promote the development of AI, the Chinese government has introduced a series of policies and measures. These policies aim to provide funding support for AI research, optimize the research environment, promote industry-university-research cooperation, and encourage innovation and talent cultivation (Azevedo et al., 2022). Through the implementation of these policies, China has made significant progress in the field of AI, promoting educational development and scientific and technological advancement exploring pathways for the integration of AI and education, and laying a solid foundation for future development (Sun, 2021).

AI is a technology based on natural intelligence, with its core goal being to deeply understand the mysteries of natural intelligence and enhance human intellectual capabilities. It is a form of intelligence created by humans to achieve this goal. AI enables computers to acquire information about specific scenarios through automatic collection or manual input and compare it with pre-stored data to determine its meaning (Jin et al., 2023). The definition of AI can be divided into four categories: machines that "think like humans," "act like humans," and "act rationally." AI is a comprehensive interdisciplinary theory and application technology that has developed based on the intersection and penetration of multiple disciplines, accompanied by the emergence of new ideas and theories against the background of rapid technological development (Azevedo et al., 2022; Jin et al., 2023). From an overall perspective, the characteristics of AI technology can be divided into three aspects: big data technology, deep learning technology, and computing power technology. These three aspects serve as the basic infrastructure supporting AI technology development and jointly support the AI technology framework (Azevedo et al., 2022; Fatih et al., 2024; Jin et al., 2023).

The development of new-generation AI faces three main dilemmas, involving ethical, legal, and social aspects. The dilemmas will have a decisive impact on the direction of AI development. There is also a structural imbalance problem in AI development, with challenges faced in technological progress from three main schools of thought: connectionism and behaviorism. The advancement of AI technology must

focus on improving the ecological environment of intelligence generation mechanisms, and this process must have ethical guarantees as support. AI possesses "energetic" characteristics, with super memory capability, flexible perceptual ability, accurate judgment capability, and amazing evolutionary ability. These capabilities enable AI to perform excellently in many fields, surpassing human abilities. However, AI also has some notable shortcomings, such as a lack of innovation ability, absence of emotions, and inability to achieve the "one brain for multiple uses" capability of the human brain.

Western countries began to focus on AI, this cutting-edge technology field, earlier. The origin of AI can be traced back to the 17th century, when two outstanding thinkers, Pascal and Leibniz, first proposed the concept of creating machines with intelligence. By the mid-20th century, in 1950, Turing raised a thought-provoking question in his paper "Computing Machinery and Intelligence": "Can machines think?" People later found it difficult to define the concept of "thinking" (Turing, 1950). To establish a clear evaluation standard for AI, Turing proposed a test called the "imitation game," which later became known as the Turing test (Azevedo et al., 2022; Fatih et al., 2024; Jin et al., 2023; Sun, 2021). After Turing began researching AI, many scholars and researchers started to show strong interest in this emerging field. At the Dartmouth Conference in 1956, John McCarthy first coined the term "artificial intelligence" and defined it as a technology aimed at making machines behave similarly to humans. In 1958, he published a paper titled "Programs with Common Sense," which pioneered the direction of AI research by focusing on the importance of common sense in AI. McCarthy also emphasized that if a program is to have learning ability, it must first be able to understand and execute instructions, focusing his research on language learning. He called this system the "advice taker," emphasizing the program's ability to accept and execute instructions (Almaiah et al., 2022; Ebadi & Amini, 2022).

Another scholar who made important contributions to the field of AI was Hector Levesque. He believed that the research focus of AI should be on how to design and create intelligent machines (List, 2019; Marnita et al., 2023). Levesque also pointed out that a major risk facing the field of AI is the autonomy issue. He worried that people might mistakenly recognize computer systems that have not yet achieved full intelligence as intelligent and grant them the power to control other machines and make decisions independently. This practice might lead to systems lacking common sense judgment making decisions that require common sense, potentially causing risks and problems (Almaiah et al., 2022; List, 2019; Marnita et al., 2023).

2.2.5 Ideological and Political Education of College Students

In China, the ideological and political education of students has garnered extensive attention and in-depth research, yielding a wealth of academic achievements. As of October 1, 2024, the China National Knowledge Infrastructure (CNKI) database lists an impressive 59,632 papers with "college students' ideological and political education"

as the subject term. It is recognized that ideological and political quality is one of the most crucial core qualities for students, and moral education is considered a task in university education (Gao, 2021). Given that college students are a vital force in the construction of modernization, universities are advised to prioritize ideological and political education in their educational endeavors. The rapid development of new media, computer networks, big data, and other modern technologies has had a profound impact on the ideological and political education of college students. Scholars have actively explored the influence of these emerging technologies in the context of the new era (Gao, 2021; Li, 2018). Their research primarily focuses on analyzing the opportunities and challenges presented by these new phenomena, identifying emerging issues, highlighting achievements, and proposing coping strategies. In contrast, the international academic community lacks a direct equivalent to the concept of "ideological and political education," (Gao, 2021; Li, 2018; Yu, 2021) and related research is relatively limited, especially in discussions regarding its value. However, educational practices abroad often include activities similar to ideological and political education, which are integrated into civic and moral education (Li et al., 2021).

2.2.6 Students' Ideological and Political Education Under the Context of Artificial Intelligence

With the rapid development and widespread application of artificial intelligence (AI), domestic scholars have actively engaged in theoretical research and practical exploration of AI in ideological and political education (Feng et al., 2023). It has been proposed that a new form of intelligent ideological and political education should be built, based on intelligent ideology and politics, with precise ideology and politics as the core and virtual ideology and politics as support. This new form aims to more effectively achieve the goals and tasks of ideological and political education (Nie, 2022). However, it is noted that while AI holds great potential and advantages in college ideological and political education, it may trigger serious problems, such as posing threats to ideological security and potentially dissolving core human values. In response to these challenges, universities should adhere to the principle of using technology as a tool and education as the foundation, balancing the "coldness" of technology with the "warmth" of humanistic care to achieve better educational outcomes (Nie, 2022; Yan, 2019).

Introducing AI into ideological and political education can change the traditional educational ecology to some extent, making personalized and precise education possible (Liu, 2024). However, overemphasizing the role of technology might lead to neglecting human subjectivity and initiative, thereby triggering new problems. In the AI era, the concepts, teaching methods, and management models of ideological and political education will undergo profound changes, bringing challenges to the subjects and ethics of this education. Issues such as "privacy," "human rights," and "responsibility" may arise, and these must be taken seriously to ensure the healthy

development of ideological and political education in the new era (Liu, 2024; Xue, 2021). Overall, scholars view the application of AI in ideological and political education as a "double-edged sword." While it can enhance educational efficiency and effectiveness, it also brings unprecedented challenges.

Internationally, research and development in AI for educational purposes have also made significant progress. Advanced teaching robots capable of intelligent analysis based on students' knowledge mastery, learning characteristics, and interests have been developed (Li et al., 2021). These robots can customize and recommend suitable learning content and resources, helping students grasp knowledge more effectively. Additionally, intelligent teaching assistants have been applied in classroom teaching, improving teacher-student relationships and significantly enhancing teaching efficiency and effectiveness. AI and education have given birth to a new field—educational AI—with two main goals: providing adaptive learning environments tailored to individual student needs and making AI a tool in the learning process. Experts emphasize that schools should keep pace with the times, update curriculum systems, and ensure students learn basic AI knowledge and how to collaborate with AI in their learning (Li et al., 2021; Yu, 2021).

Robots, as representatives of advanced AI technology, have attracted significant attention in educational applications. Japan, a leader in robot education, has integrated robot-related courses into primary and secondary education and established related research programs in higher education (Li, 2018). Other countries, including the United States, Germany, and South Korea, are also actively engaged in research on robot education. Integrating robots into students' daily learning can create superior conditions for personalized learning, allowing each student to learn at their own pace and in their way (Azevedo et al., 2022; Yue et al., 2022).

In summary, current research on reform and innovation in college students' ideological and political education in China is conducted against the Internet, big data, and new media. Research achievements related to AI in this field are relatively few and in the preliminary stage. Existing studies mainly focus on the connotation, objectives, and values of AI in ideological and political education (Sun, 2021; Yue et al., 2022), while practical research is scarce and lacks a systematic framework. Therefore, future research should focus on in-depth discussions of the internal requirements, application prospects, achievements, challenges, and practical paths of AI in ideological and political education (Gao, 2021). Only through such efforts can we better promote the reform and innovation of this education in the AI era and provide strong support for cultivating high-quality talents in the new era.

2.3 Profile of Wuhan University of Technology

Wuhan University of Technology (WUT) is a prestigious public research university located in Wuhan, Hubei Province, China. Established through the merger of three universities in 2000, WUT has grown into a leading institution accredited by the Chinese Ministry of Education, with a focus on multidisciplinary research and innovation. The university is organized into 25 academic schools, offering 96 bachelors', 226 masters', and 77 doctoral degree programs. It is recognized for its strong research output, particularly in materials science, chemical engineering, and nanotechnology.

WUT is committed to fostering global collaboration and has established partnerships with numerous international universities and research institutions. It hosts several high-level international research cooperation platforms and has been involved in international joint research projects. The university has also developed international programs, including double-degree courses in collaboration with institutions such as Aix-Marseille University. With a total land area of 2.67 million square meters and a gross floor area of 1.95 million square meters, WUT's campuses are equipped with state-of-the-art facilities, including four modern libraries and four national technology innovation bases. The university has over 5,400 faculty and staff members and a student population of more than 54,000, including approximately 1,700 international students. WUT has been ranked in various global university rankings, including the QS World University Rankings. In addition to its academic and research achievements, WUT is known for its commitment to technological innovation and the development of key disciplines. It has won numerous national and provincial-level scientific and technological awards and has been involved in major research projects funded by the Chinese government.

2.4 Conceptual Framework

This study examines the influencing factors of ideological and political education for students at Wuhan University of Technology in the context of artificial intelligence. Through literature review, a model is constructed and hypotheses are proposed. The model is shown in Figure 2.1.

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┌─────────────────────────┐        ▼   ┌───────────────────────────────┐
│ Teachers' Digital Literacy │──────────▶│ Effectiveness of Ideological  │
└─────────────────────────┘        ▲   │ and Political Education        │
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│ Student Motivation      │────────┘
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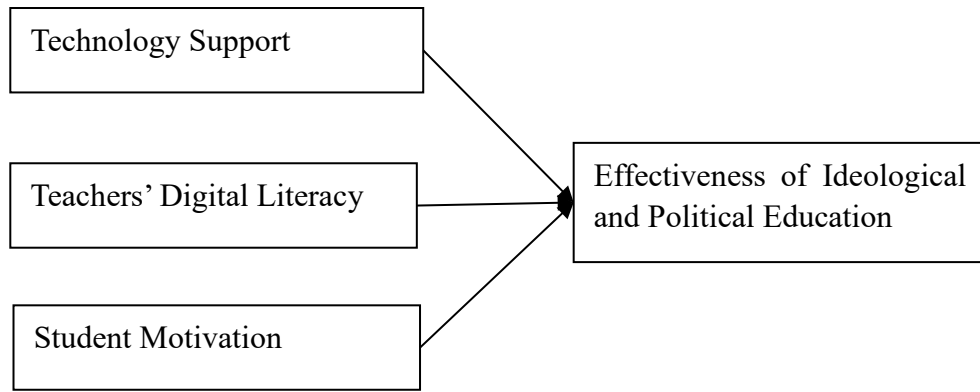
Figure 2.1 Conceptual Framework

Chapter 3 Research Methodology

3.1 Research Design

This study designed a conceptual model for the implementation pathways of ideological and political education for college students at Wuhan University of Technology in the context of artificial intelligence. The independent variables include technology support, teachers' digital literacy, and student motivation. The dependent variable is ideological and political education. This study employed quantitative methods to obtain actual feedback and data support from students at Wuhan University of Technology. The designed questionnaire consists of 20 questions, utilizing a Likert five-point scale to ensure operability and consistency in the evaluation of various factors.

3.2 Population and Sample

The survey subjects were undergraduate students at Wuhan University of Technology. The data collection period was from December 2024 to February 2025. With the assistance of the Student Affairs Office of Wuhan University of Technology, eligible students were randomly selected of participate in the survey. The research team distributed the questionnaires to the respondents with detailed explanations of the research objectives and the requirements for completion, ensuring that participants fully understood the questions and responded accurately, thereby enhancing the accuracy and representativeness of the data. A total of 400 questionnaires were distributed. The research team conducted rigorous data reviews to exclude invalid questionnaires with incomplete or inconsistent responses. Ultimately, 303 valid questionnaires resulted in an effective response rate of 75.75%.

3.3 Hypothesis

The relationship between the variables is set through hypotheses. Therefore, hypotheses are formulated:

H1: Technology support positively impacts the effectiveness of ideological and political education for students at Wuhan University of Technology.

H2: Teachers' digital literacy positively impacts the effectiveness of ideological and political education for students at Wuhan University of Technology.

H3: Student motivation positively impacts the effectiveness of ideological and political education for students at Wuhan University of Technology.
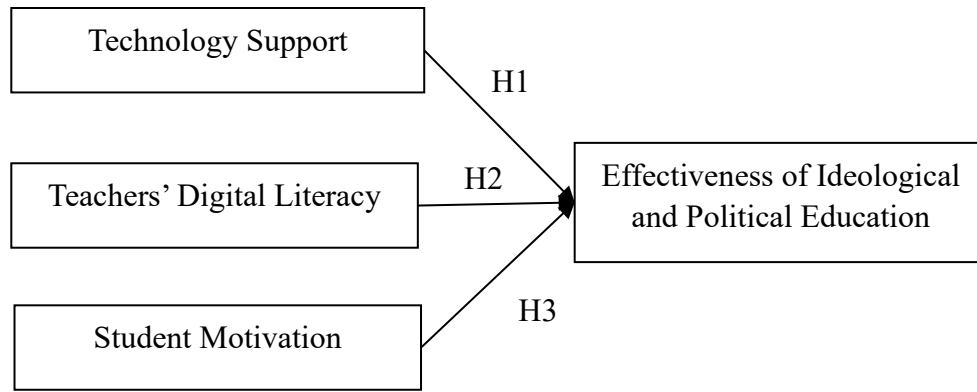
Figure 3.1 Hypotheses

3.4 Research Instrument

This questionnaire focuses on the implementation pathways of ideological and political education for college students at Wuhan University of Technology in the context of artificial intelligence. It aims to quantitatively explore the impact of three key factors—technology support, teachers' digital literacy, and student motivation—on the effectiveness of ideological and political education. Adhering to the principles of scientific rigor and systematic design, the questionnaire employs a Likert five-point scale and consists of 20 items, with five items designed for each variable to comprehensively and systematically assess the role of these factors in ideological and political education.

The questionnaire revolves around four core variables: technology support, teachers' digital literacy, student motivation, and the overall effectiveness of ideological and political education. The questions are designed to reflect the intrinsic logic and interrelationships among these variables, aiming to capture students' perceptions, experiences, and evaluations of ideological and political education from multiple dimensions. The section on technology support assesses students' experiences with existing technological tools and platforms, and the practical effectiveness of technology in enhancing learning interactivity and content comprehension. The section on teachers' digital literacy focuses on teachers' ability to utilize digital technology in ideological and political education and the positive impact of this ability on students' learning experiences. The section on student motivation evaluates students' interest in and engagement with ideological and political education, as well as their intrinsic sense of identification, thereby reflecting their enthusiasm and proactivity in learning. The section on ideological and political education measures students' overall satisfaction with the content, teaching methods, and effectiveness of the education. Through this comprehensive design, the questionnaire can collect students' subjective evaluations of each factor and provide reliable data support for subsequent quantitative analysis. This approach reveals the underlying connections among the variables and their combined impact on the effectiveness of ideological and political education.

Table 3.1 Measurement Items

Dimension	Measurement Item	NO.
Technology Support	1. I believe that the current technological tools and platforms provided for ideological and political education are sufficient for my learning needs.	Q1
	2. Artificial intelligence and other advanced technologies in ideological and political education enhance my understanding of the content.	Q2
	3. The technological resources available for ideological and political education are easy to access and use.	Q3
	4. Artificial intelligence in ideological and political education has improved the interactivity of the learning process.	Q4
	5. I feel that the technological support provided for ideological and political education is up-to-date and reflects the latest advancements.	Q5
Teachers' Digital Literacy	1. My teachers are proficient in using digital tools and resources for ideological and political education.	Q6
	2. Teachers' ability to integrate digital technology into ideological and political education enhances my learning experience.	Q7
	3. I feel that my teachers are well-trained in digital literacy, which positively impacts their teaching of ideological and political education.	Q8
	4. Teachers' use of digital resources makes the content of ideological and political education more engaging.	Q9
	5. I am satisfied with the level of digital literacy demonstrated by my teachers in the context of ideological and political education.	Q10
Student Motivation	1. I am highly motivated to engage in ideological and political education courses.	Q11
	2. The content of ideological and political education is relevant and interesting, which keeps me motivated to learn.	Q12
	3. I feel that the teaching methods used in ideological and political education effectively stimulate my interest in learning.	Q13
	4. I am motivated to participate actively in discussions and activities related to ideological and political education.	Q14
	5. I believe that the knowledge and values taught in ideological and political education are important for my personal development, which drives me to learn more.	Q15
Ideological and Political Education	1. I feel that the overall quality of ideological and political education is high.	Q16
	2. The ideological and political education courses effectively help me understand important social and political concepts.	Q17

	3. I am satisfied with the ideological and political education.	Q18
	4. The content of ideological and political education is well-integrated with real-life issues, making it more meaningful.	Q19
	5. I believe that the ideological and political education I receive has a positive impact on my personal and professional growth.	Q20

3.5 Reliability and Validity Analysis of the Scale

3.5.1 Questionnaire Reliability Analysis

The reliability of each variable was assessed using Cronbach's Alpha, a widely accepted measure of internal consistency. Table 3.2 indicates that each variable was measured using a set of five items. The reliability coefficients for the variables are as follows: Technology Support (α = 0.766), Teachers' Digital Literacy (α = 0.744), Student Motivation (α = 0.719), and Ideological and Political Education (α = 0.799). These values suggest that the scales used to measure each variable demonstrate satisfactory levels of internal consistency, with all Cronbach's Alpha values exceeding the commonly accepted threshold of 0.70. This indicates that the items within each scale are sufficiently correlated and collectively measure the underlying construct effectively. All variables have Cronbach's Alpha coefficients above 0.7, indicating that each scale has acceptable internal consistency and high reliability. Generally, Cronbach's Alpha values between 0.7 and 0.8 are considered reliable, suggesting that the various sections of the questionnaire in this study are designed reasonably and that the measurement tools can effectively reflect financial risk factors and management levels. The close reliability among different variables reflects the consistency and coordination of the scale in its overall design, providing reliable data support for the study, as shown in Table 3.2.

Table 3.2 Variable Reliability Test

Variables	Cronbach's Alpha	N of Items
Technology Support	0.766	5
Teachers' Digital Literacy	0.744	5
Student Motivation	0.719	5
Ideological and Political Education	0.799	5

3.5.2 Questionnaire Validity Analysis

The KMO measure evaluates the adequacy of the sample for factor analysis by comparing the size of the observed correlations to the size of the partial correlations among variables. A KMO value of 0.890 indicates that the data are highly suitable for factor analysis, as values above 0.8 are generally considered to be excellent indicators

of sampling adequacy. Bartlett's Test of Sphericity examines the hypothesis that the correlation matrix is an identity matrix, which would indicate that the variables are unrelated and unsuitable for structure detection. The test results show an approximate chi-square value of 1766.5 with 134 degrees of freedom and a significance level (Sig.) of 0.000. The extremely low significance value (p < 0.001) suggests that the null hypothesis can be rejected, confirming that the correlation matrix is significantly different from an identity matrix. This result further supports the appropriateness of the data for factor analysis.

The results of both the KMO measure and Bartlett's Test of Sphericity indicate that the data are highly suitable for conducting factor analysis, providing a strong basis for subsequent exploratory factor analysis. This implies that there is sufficient correlation between the variables, and factor analysis is applicable. Factors with eigenvalues greater than 1 were extracted, and the total cumulative explained variance reached 77.333%.

Table 3.3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.890
Bartlett's Test of Sphericity	Approx. Chi-Square	1766.5
	df	134
	Sig.	0.000

3.6 Data Collection

The scope of this study was specifically focused on students at Wuhan University of Technology, with the understanding that it did not encompass other regions or types of universities, thereby introducing regional limitations. The research subjects were students from Wuhan University of Technology who have already undergone ideological and political education. Given their exposure to this form of education, these students possess a profound understanding and are well-positioned to provide reasoned evaluations. Their ability to offer unique insights based on their learning experiences ensures that the collected data is both highly reliable and representative. The research framework encompasses three key dimensions: intelligent technology support, teachers' digital literacy, and students' learning motivation. In the data collection process, a total of 400 questionnaires were distributed. The research team conducted rigorous data reviews to exclude invalid questionnaires with incomplete or inconsistent responses. Ultimately, 303 valid questionnaires were recovered, yielding an effective response rate of 75.75%.

3.7 Data Analysis

3.7.1 Descriptive Statistics

The software used in the descriptive statistics included Excel and SPSS, and the statistical analysis on the mean, standard deviation, percentage, normal distribution, kurtosis value, and skewness value were mainly conducted on the demographic characteristics of sample. Descriptive statistics provided basic support for further analysis of the data.

3.7.2 Factor Analysis

Exploratory factor analysis was conducted on the survey data through SPSS to extract common factors and determine the common dimensions of ideological and political education. The reliability and validity of the constructed model were determined, which provided a theoretical basis for the improvement of the ideological and political education for students at Wuhan University of Technology in the context of artificial intelligence.

3.7.3 Correlation Analysis

Correlation analysis is a statistical method used to assess the strength and direction of the relationship between two or more variables. In this study, correlation analysis was employed to explore whether there exists an association between different variables and whether this association is positive, negative, or indicates no significant relationship.

Chapter 4 Findings and Discussion

4.1 Findings

4.1.1 Demographic Characteristics of Participants

The results provide a comprehensive overview of the demographic characteristics of the 303 participants in the study. The data reveal a nearly balanced gender distribution, with 147 male students (48.5%) and 156 female students (51.5%). In terms of grade level, the majority of participants are from the first three years of university, with 96 first-year students (31.7%), 89 second-year students (29.4%), and 85 third-year students (28.1%), while only 33 participants (10.9%) are in their fourth year. Monthly income levels are categorized into five ranges, with the largest proportion of students (22.1%) reporting an income between 10001–20000, followed by those earning 3001–6000 (22.8%) and 6001–10000 (18.8%). The lowest income range (below 3000) accounts for 15.8% of participants, while the highest income range (above 20000) comprises 20.5%. Participants are also categorized into four major groups: Science and Engineering (22.1%), Humanities and Social Sciences (28.7%), Economics and Management (29.4%), and Arts and Design (19.8%). The largest proportion of students is from the Economics and Management major, while the smallest proportion is from Arts and Design. Overall, the sample reflects a diverse representation of students across gender, grade level, income, and major categories, providing a robust basis for the study.

Table4.1 Descriptive Statistical Analysis of Participants

Item	Options	Frequency	Percent
Gender	Male	147	48.5%
	Female	156	51.5%
Grade	First year of university	96	31.7%
	Second year of university	89	29.4%
	Third year of university	85	28.1%
	Fourth year of university	33	10.9%
Monthly Income	below 3000	48	15.8%
	3001-6000	69	22.8%
	6001-10000	57	18.8%
	10001-20000	67	22.1%
	Above20000	62	20.5%
Majors	Science and Engineering	67	22.1%
	Humanities and Social Sciences	87	28.7%
	Economics and Management	89	29.4%
	Arts and Design	60	19.8%
	Total	303	100.0%

4.1.2 Correlation Analysis

Table 4.2 Correlation Between Variables (Pearson Correlation Matrix)

	Technology Support	Teachers' Digital Literacy	Student Motivation	Ideological and Political Education
Technology Support	1			
Teachers' Digital Literacy	.711**	1		
Student Motivation	.756**	.779**	1	
Ideological and Political Education	.770**	.669**	.699**	1

NOTE：*P<0.05, **P<0.01, ***P<0.001

The data analysis results reveal the correlations between four variables: technology support, teachers' digital literacy, student motivation, and ideological and political education. Each variable exhibits a strong positive correlation with the others, with correlation coefficients exceeding 0.66 and reaching statistical significance (P<0.01). This indicates a close relationship among these variables.

Technology support shows high correlations with teachers' digital literacy, student motivation, and ideological and political education. The highest correlation coefficient is observed between technology support and ideological and political education (.770). The correlation coefficients between technology support and student motivation (.756) and teachers' digital literacy (.711) are above 0.7. This suggests that robust technology support enhances teachers' digital literacy, which influences student motivation and positively impacts the implementation of ideological and political education. The application of technology in the educational process not only improves teaching effectiveness but also increases students' interest and motivation to learn.

The highest correlation coefficient is found between teachers' digital literacy and student motivation (.779), indicating that teachers' digital literacy may be a significant factor influencing student motivation. The stronger a teacher's digital skills in a digital teaching environment, the more effectively they can engage students, enhance their interest in learning, and promote more efficient teaching interactions. Although the correlation between teachers' digital literacy and ideological and political education (.669) is relatively lower, it still reaches a strong level, suggesting that teachers' digital capabilities may also influence the implementation of ideological and political education.

The correlation coefficient between student motivation and ideological and political education is .699, indicating that the effective implementation of ideological and political education may positively promote student motivation. Alternatively, higher student motivation may make them more receptive to the influence of

ideological and political education. This relationship highlights the role of ideological and political education in shaping students' attitudes toward learning and their values.

The data support a mutually reinforcing relationship among technology support, teachers' digital literacy, student motivation, and ideological and political education. Technology support and teachers' digital literacy play a role in promoting student motivation and the effectiveness of ideological and political education. These findings suggest that increasing technological investment and teacher training could enhance overall teaching quality and the effectiveness of ideological and political education.

Based on the results of the analysis in Table 4.2, the relationships between the variables were derived. Therefore, technology support positively impacts the effectiveness of ideological and political education for students at Wuhan University of Technology, which supports Hypothesis 1. Teachers' digital literacy positively impacts the effectiveness of ideological and political education for students at Wuhan University of Technology, which supports Hypothesis 2. Student motivation positively impacts the effectiveness of ideological and political education for students at Wuhan University of Technology, which supports Hypothesis 3.

4.2 Discussion

4.2.1 Technology Support Positively Impacts the Effectiveness of Ideological and Political Education for Students at Wuhan University of Technology

The findings of this study indicate that technological support has a positive impact on the implementation pathways of ideological and political education for students at Wuhan University of Technology. In the process of ideological and political education, the application of technological means facilitates the achievement of educational objectives, enhances educational effectiveness, and increases students' acceptance and participation. The research findings align with the trends of modern educational technology theory and information-based education. With the continuous development of digital technology, online courses, smart classrooms, big data analysis, and other technological means provide ideological and political education with richer resources and diversified teaching methods.

Through virtual simulation experiments, online interactive discussions, and AI-assisted teaching, teachers can vividly explain ideological and political content, enhance students' interest in learning, and promote the internalization of knowledge and the shaping of values. Digital technology can improve the convenience and accessibility of teaching, enabling ideological and political education to transcend the limitations of traditional classrooms. Through mobile learning platforms, students can access learning resources anytime and anywhere, enhancing their self-directed learning abilities.

Technological support contributes to enhancing teachers' instructional capabilities and curriculum innovation levels.

Teachers can utilize intelligent teaching tools to analyze students' learning situations in real time and adjust teaching content and methods based on data for more precise instruction. Information-based means can also strengthen teacher-student and student-student interactions, such as through online forums, questionnaires, and intelligent recommendation systems, enabling students to more actively express their opinions and participate in discussions in ideological and political education courses, thereby enhancing the practical effectiveness of the courses.

The effective application of technology depends on teachers' digital literacy and instructional competence. If teachers cannot fully leverage technological tools, the role of technology is diminished. Over-reliance on technology can lead to the "formalization" of education, where excessive focus on technology use neglects the essential goals of ideological and political education-guiding values and cultivating thinking abilities. The research findings reveal the significant role of technological support in ideological and political education, providing empirical evidence for universities to advance educational informatization.

4.2.2 Teachers' Digital Literacy Positively Impacts the Effectiveness of Ideological and Political Education for Students at Wuhan University of Technology

The research results demonstrate that teachers' digital literacy has a positive impact on the implementation pathways of ideological and political education for students at Wuhan University of Technology. This finding aligns with the current trend of educational digital transformation. With the widespread application of information technology, teachers' digital literacy influences teaching efficiency and affects the quality and effectiveness of ideological and political education. In the practical teaching of ideological and political education, teachers' digital literacy is manifested in their proficiency in multimedia tools, online education platforms, data analysis methods, virtual reality, and other emerging technologies to enhance classroom interactivity, content vividness, and educational pertinence.

Teachers with high digital literacy can better integrate information technology into ideological and political education, thereby enhancing the attractiveness and impact of the curriculum. Through digital resources, teachers can utilize online courses, video cases, real-time data analysis, and other methods to make abstract theories more realistic, enabling students to grasp the core content of ideological and political education in specific contexts. The application of social media and intelligent discussion platforms facilitates more convenient teacher-student interactions, which helps to boost students' learning enthusiasm and promote the cultivation of critical

thinking. Teachers' digital literacy is not merely about the accumulation of technology. It is crucially about updating teaching philosophies. Universities need to strengthen digital capability training for teachers.

Teachers should not only be proficient in operating technological tools but also deeply integrate them into ideological and political education to enhance the ideological and practical aspects of the curriculum. Teachers' adaptability and innovative consciousness will influence teaching models. The research results emphasize the crucial role of teachers' digital literacy in ideological and political education, indicating that the core of educational informatization does not lie solely in relying on technology but rather in how to empower teachers through technology to more effectively disseminate the values of ideological and political education and guide students in establishing correct worldviews, outlooks on life, and values.

4.2.3 Student Motivation Positively Impacts the Effectiveness of Ideological and Political Education for Students at Wuhan University of Technology

The research results indicate that students' learning motivation has a positive impact on the implementation pathways of ideological and political education at Wuhan University of Technology. This finding underscores the pivotal role of student initiative in the educational process. The objective of ideological and political education is not only the imparting of knowledge but also the shaping of values, and the effectiveness of this process largely depends on students' learning motivation. The stronger the motivation, the more willing students are to actively think and delve deeply into the core issues presented in ideological and political courses, thereby enhancing the practical effectiveness of education.

When students possess high levels of learning motivation, they engage more actively in classroom discussions, case analyses, and practical activities, transforming ideological and political education from a one-way transmission into an interactive and inquiry-based learning process. Students with high learning motivation proactively utilize online resources, such as watching related lectures, participating in social practices, or expressing their opinions on social platforms. These actions contribute to deepening their understanding of the content of ideological and political education and internalizing theoretical knowledge into their values. Enhanced learning motivation also fosters positive interactions between teachers and students, enabling teachers to more accurately grasp students' needs and optimize instructional design, making course content more relevant to students' interests and real-world concerns.

By employing case studies, interactive learning, practical activities, and other methods, ideological and political education becomes more engaging and realistic, enabling students to appreciate the value of the curriculum in solving practical problems. The reasonable application of digital technology, such as online discussions,

virtual simulation experiments, or interdisciplinary integration, can stimulate students' interest and make them willing to learn. The learning motivation is not limited to within the classroom but also requires a supportive campus culture and social atmosphere. When students recognize the practical significance of ideological and political education and experience its value in real life, their learning initiative naturally increases.

The research results further validate the central role of students' learning motivation in the implementation process of ideological and political education. To enhance the practical effectiveness of ideological and political education, it is necessary to not only focus on teachers' instructional capabilities and technological support but also to stimulate students' intrinsic motivation, enabling them to genuinely view ideological and political education as an integral part of their personal growth. Only when students possess sufficient learning motivation can they achieve cognitive, emotional, and behavioral transformations in ideological and political education, ensuring that educational objectives are realized.

Table 4.4 Hypothesis Test Results

NO.	Hypothesis	Result
H1	Technology support positively impacts the effectiveness of ideological and political education for students at Wuhan University of Technology.	Supported
H2	Teachers' digital literacy positively impacts the effectiveness of ideological and political education for students at Wuhan University of Technology.	Supported
H3	Student motivation positively impacts the effectiveness of ideological and political education for students at Wuhan University of Technology.	Supported

The verification results of the aforementioned three hypotheses indicate that various factors influencing the implementation pathways of ideological and political education for college students have a significant positive impact. This outcome reflects the importance of placing great emphasis on intelligent technological support, teachers' digital literacy, and students' learning motivation in the implementation pathways of ideological and political education for college students at Wuhan University of Technology against the backdrop of artificial intelligence.

Chapter 5 Conclusion and Recommendation

5.1 Conclusion

This study verified the impact of technological support, teachers' digital literacy, and students' learning motivation on the effectiveness of ideological and political education at Wuhan University of Technology, supporting the corresponding research hypotheses.

The research findings reveal that technological support has a positive impact on the implementation pathways of ideological and political education, suggesting that the application of information technology can enhance the dissemination effectiveness and influence of ideological and political education. Teachers' digital literacy plays a pivotal role in the implementation process of ideological and political education. Teachers with higher digital literacy are more proficient in utilizing modern teaching technologies, optimizing classroom designs, and improving the vividness and interestingness of instruction, thereby enhancing students' engagement and identification with ideological and political courses. The impact of students' motivation to learn on the effectiveness of implementing ideological and political education is significant.

The support of information technology, the enhancement of teachers' digital literacy, and the strengthening of students' learning motivation all contribute to the effective implementation of ideological and political education. Therefore, when promoting ideological and political education, universities should strengthen technological investments, enhance teachers' information-based teaching capabilities, and adopt various methods to stimulate students' learning motivation, to construct a more efficient ideological and political education system.

5.2 Recommendation

5.2.1 Strengthening Technological Support and Building Platform

Wuhan University of Technology should fully leverage artificial intelligence technology to build an intelligent ideological and political education platform, enhancing the intelligence, interactivity, and personalization of teaching. The university should develop AI-driven personalized learning systems that utilize big data and machine learning algorithms to analyze students' learning habits and interests, recommending personalized ideological and political education resources such as intelligent course recommendations and dynamic knowledge maps. Administrators should introduce virtual reality (VR) and augmented reality (AR) technologies to establish "Red Culture Immersive Experience Centers" and "Virtual Ideological and Political Practice Bases," allowing students to deepen their understanding of ideological

and political theories through immersive interactive learning. The Wuhan University of Technology should establish an AI-intelligent Q&A system to provide students with online question-answering and intelligent tutoring, enhancing the convenience and accessibility of ideological and political education learning. The university should construct an intelligent blended learning mode, promoting the deep integration of online and offline ideological and political education. Students can engage in online self-study of ideological and political theories and deepen their understanding through offline seminars, case studies, and other methods.

5.2.2 Enhancing Teachers' Digital Literacy and Promoting Technology

Research findings indicate that teachers' digital literacy has a crucial impact on the implementation pathways of ideological and political education. Therefore, the university should establish a systematic AI training mechanism for teachers to enhance their proficiency with intelligent teaching tools. Regular AI and educational technology application training should be held, inviting AI and education experts to instruct, enabling teachers to skillfully use intelligent teaching tools, data analysis methods, and AI-assisted teaching strategies. Promote interdisciplinary collaboration by encouraging teachers of ideological and political education to collaborate with experts in computer science, educational technology, and other fields to research the deep application of AI in ideological and political education, such as utilizing natural language processing to optimize classroom discussions or employing sentiment analysis to evaluate students' learning feedback. The university could set up a research center for "AI + Ideological and Political Education," encouraging teachers to pilot intelligent teaching reforms and explore how AI technology enhances the vividness, personalization, and precision of courses, thereby improving the overall quality of ideological and political education. Develop an AI mentor system to provide students with intelligent growth planning suggestions, such as recommending relevant ideological and political education courses, social practice projects, or career development paths based on learning performance and interests, helping students integrate ideological and political theories with personal growth, thereby enhancing the practical significance and attractiveness of the courses.

5.2.3 Enhancing Students' Learning Motivation and Creating Intelligent Interactive Classrooms

Wuhan University of Technology should utilize AI technology to create more interactive and personalized ideological and political classrooms, making the learning process more engaging. The university should introduce intelligent classroom analysis systems that use AI technology to monitor classroom interactions in real-time, such as students' attention levels, participation, and feedback, adjusting teaching strategies based on data analysis to enhance classroom appeal. The university can leverage AI technology to create intelligent learning communities, encouraging students to engage

in online exchanges, case discussions, and idea collisions on the platform, forming a learning community for ideological and political education. The Wuhan University of Technology should utilize AI-driven intelligent interactive systems to introduce interactive forms such as real-time online discussions, virtual debates, and intelligent knowledge quizzes into ideological and political classrooms, allowing students to engage in learning through gamified and competitive methods. Combined with big data analysis technology, the university can provide students with automated learning assessments and personalized learning path recommendations, ensuring that students at different levels can access suitable learning content, thereby stimulating students' interest and initiative in learning and enhancing the effectiveness of ideological and political education. The university should establish an AI reward points system to encourage students to accumulate learning points through online learning, classroom interactions, and ideological and political education practical activities, with points redeemable for honor certificates, learning resources, or participation in special practical projects, enhancing students' learning motivation.

5.3 Further Study

This study explores the impact of technological support, teachers' digital literacy, and students' learning motivation on the implementation pathways of ideological and political education at Wuhan University of Technology, and proposes corresponding optimization strategies against the backdrop of artificial intelligence (AI). However, there are still some research limitations, which provide directions for future research expansion. Primarily focused on the ideological and political education at Wuhan University of Technology, future studies can further broaden the scope by including different types of universities (such as comprehensive universities, science and engineering universities, and humanities and social sciences universities) or universities in various regions as research subjects, to investigate the universality and adaptability of AI technologies in the implementation of ideological and political education.

This study mainly adopted quantitative research methods, verifying the relationships among various variables based on data analysis. Future research could introduce qualitative research methods, such as in-depth interviews, case studies, or classroom observations, to gain a more comprehensive understanding of the specific processes and practical challenges of AI-enabled ideological and political education. While this study examines the influence of three factors—technological support, teachers' digital literacy, and students' learning motivation—on ideological and political education, the effectiveness of its implementation may also be affected by various other factors, including policy environments, course content, and social practices. Future studies can expand the variable system to explore the facilitative roles of policy support, university-enterprise cooperation, social practice platforms, and other factors in ideological and political education in the context of AI, with the aim of

constructing a more systematic optimization pathway for ideological and political education.

Future research can expand in terms of research scope, research methods, influencing factors, and technological applications, to more comprehensively and deeply explore the theoretical framework and practical pathways of AI-enabled ideological and political education, providing more empirically supported research findings for the innovative development of ideological and political education in universities.

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Appendix

Dear students,

Thank you for your participation in this questionnaire survey. The survey will be conducted anonymously, and your relevant information will be kept confidential. Thank you again for your cooperation.

Part Ⅰ:

1. Gender?
A Male   B Female

2. Grade?
A First year of university
B Second year of university
C Third year of university
D Fourth year of university

3. Your monthly income?
A below 3000 B 3001-6000 C 6001-10000 D 10001-20000 E Above20000

4. Majors?
A Science and Engineering
B Humanities and Social Sciences
C Economics and Management
D Arts and Design

Part Ⅱ: Please judge to what extent you agree with the following statement; choose the most appropriate option, and mark the corresponding number " √ . " The questionnaire used a Likert scale, ranging from 1 to 5 in which one indicates strongly disagree, two indicates relatively disagree, three indicates neutral, four indicates relatively agree (, and five indicates strongly agree.

Dimension	Measurement Item	1	2	3	4	5
Technology Support	1. I believe that the current technological tools and platforms provided for ideological and political education are sufficient for my learning needs.	1	2	3	4	5

	2. Artificial intelligence and other advanced technologies in ideological and political education enhance my understanding of the content.	1	2	3	4	5
	3. The technological resources available for ideological and political education are easy to access and use.	1	2	3	4	5
	4. Artificial intelligence in ideological and political education has improved the interactivity of the learning process.	1	2	3	4	5
	5. I feel that the technological support provided for ideological and political education is up-to-date and reflects the latest advancements.	1	2	3	4	5
Teachers' Digital Literacy	1. My teachers are proficient in using digital tools and resources for ideological and political education.	1	2	3	4	5
	2. Teachers' ability to integrate digital technology into ideological and political education enhances my learning experience.	1	2	3	4	5
	3. I feel that my teachers are well-trained in digital literacy, which positively impacts their teaching of ideological and political education.	1	2	3	4	5
	4. Teachers' use of digital resources makes the content of ideological and political education more engaging.	1	2	3	4	5
	5. I am satisfied with the level of digital literacy demonstrated by my teachers in the context of ideological and political education.	1	2	3	4	5
Student Motivation	1. I am highly motivated to engage in ideological and political education courses.	1	2	3	4	5
	2. The content of ideological and political education is relevant and interesting, which keeps me motivated to learn.	1	2	3	4	5
	3. I feel that the teaching methods used in ideological and political education effectively stimulate my interest in learning.	1	2	3	4	5
	4. I am motivated to participate actively in discussions and activities related to ideological and political education.	1	2	3	4	5
	5. I believe that the knowledge and values taught in ideological and political education	1	2	3	4	5

	are important for my personal development, which drives me to learn more.					
Ideological and Political Education	1. I feel that the overall quality of ideological and political education is high.	1	2	3	4	5
	2. The ideological and political education courses effectively help me understand important social and political concepts.	1	2	3	4	5
	3. I am satisfied with the ideological and political education.	1	2	3	4	5
	4. The content of ideological and political education is well-integrated with real-life issues, making it more meaningful.	1	2	3	4	5
	5. I believe that the ideological and political education I receive has a positive impact on my personal and professional growth.	1	2	3	4	5