



Research on Strategies for Enhancing the Digital Competence of University Counselors from the Perspective of Artificial Intelligence

Shuangyan Long^{a*}, Dianjin Xie^b, Xiaoxue Ding^c

Hunan Automotive Engineering Vocational University, Zhuzhou, Hunan, 412000, China

^{a*}56013923@qq.com, ^b343498763@qq.com, ^c847294851@qq.com

Abstract. The rapid development of artificial intelligence (AI) technology has brought both opportunities and challenges to ideological and political education in universities. As the backbone of ideological and political education for college students, the digital competence of university counselors directly impacts the effectiveness of their educational efforts. This study focuses on strategies for enhancing the digital competence of university counselors from the perspective of AI. Firstly, it elucidates the connotation and components of digital competence for university counselors in the context of AI, constructing a digital competence model comprising four dimensions: digital awareness, digital knowledge, digital skills, and digital ethics. Secondly, through questionnaires and interviews, the current state of digital competence among university counselors was investigated and analyzed, revealing issues such as weak digital awareness, insufficient digital knowledge, inadequate digital skills, and a lack of digital ethics awareness. Finally, based on the analysis of the current situation, strategies for enhancing the digital competence of university counselors from the perspective of AI are proposed at the national, institutional, and individual levels, aiming to provide references for the development of university counselor teams.

Keywords: Artificial Intelligence, University counselors, Digital competence, Enhancement strategies

1 Introduction

The rapid development of artificial intelligence technology is profoundly changing the production and lifestyle of human society, and also bringing unprecedented challenges and opportunities to ideological and political education in colleges and universities. On the one hand, artificial intelligence technology empowers ideological and political education, providing new possibilities for innovating educational models and enhancing educational effectiveness. On the other hand, artificial intelligence technology also brings a series of challenges: algorithmic recommendations may lead to information cocoons and intensify the differentiation of students' values; The content generated by artificial intelligence may impact the mainstream ideology and increase the difficulty

of ideological and political education. Human-computer interaction may affect students' interpersonal communication skills and bring about new psychological problems. Facing the new situation, ideological and political education in colleges and universities must proactively embrace artificial intelligence technology and actively explore new paths for the deep integration of artificial intelligence and ideological and political education, so as to better shoulder the contemporary mission of fostering virtue and nurturing talent.

College counselors are the backbone force in carrying out ideological and political education for college students, and their digital competence level directly affects the quality and effect of ideological and political education. Digital competence refers to an individual's ability to effectively acquire, analyze, evaluate, create and utilize information, as well as solve practical problems in a digital environment. In the era of artificial intelligence, digital competence has become a core quality for college counselors. Enhancing the digital competence of college counselors is an inevitable requirement for addressing the new challenges of ideological and political education in the era of artificial intelligence, and it is also a key measure to promote the high-quality development of ideological and political education.

2 Connotation and Composition of Digital Competence of College Counselors from the Perspective of Artificial Intelligence

2.1 The Connotation of Digital Competence for University Counselors

The concept of digital literacy was first proposed by Yoram Eshet-Alkalai. He put forward that digital literacy includes literacy in aspects such as image-image, recreation, branching, information, and society-emotion^[1]. Later, more and more scholars discussed digital literacy from different perspectives. Bawden explores the connotation of digital literacy from the perspective of social mass culture^[2]; Ng,W defines digital literacy from three cross-dimensions: technology, cognition, and social emotion^[3].

Li Degang in China believes that digital literacy is the ability to integrate and recreate digital content using digital technologies, and to effectively disseminate and interact with it^[4]; Zhang Wei attaches greater importance to the ability in information science and believes that digital literacy encompasses people's ability to operate computers, read and write online content^[5].

2.2 Components of Digital Competence for University Counselors

Based on the "Teacher Digital Literacy" industry standard for the education sector released by the Ministry of Education in 2022, and combined with the three dimensions of counselor quality and competence extracted from the "Professional Competence Standards for University Counselors (Interim)"—management quality, professional quality, and ideological leadership quality—a preliminary framework for the digital competence of university counselors has been constructed. This framework includes 4

primary dimensions, 8 secondary dimensions, and 19 tertiary dimensions. Details are shown in Table 1.

Table 1. Components of Digital Competence for University Counselors

Primary Dimension	Secondary Dimension	Tertiary Dimension
Digital Awareness	Digital Awareness	Recognizing the value and impact of intelligent technology on teaching and learning, actively adapting to the current intelligent learning environment
		Proactively using intelligent learning tools to acquire professional skills needed for future teaching careers
	Educational Data Insight	Ability to interpret machine learning algorithms in predicting student behavior
		Application analysis of knowledge graph technology in academic early warning
Digital Knowledge	Data Management System	Correlation analysis of multimodal data (text/voice/image)
		Dynamic maintenance and updating of student digital profiles.
	Mastery	Integration and management of multi-source heterogeneous data (academic data/consumption data/social data)
		Effective invocation of intelligent decision support systems
Digital Skills	Intelligent Decision Support	Formulation of precise intervention plans based on predictive models
		Algorithm-assisted design of personalized growth paths
	Data Education	Intelligent simulation and strategy validation of group dynamics
		Personalized guidance using intelligent technology digital profiles.
Digital Ethics	Collaborative Education	Innovative application scenarios of generative AI in education
		Dynamic adaptation to human-computer collaborative work modes
	Network Moral Standards	Expanding teacher-student and home-school communication using smart campus systems
		Ethical boundary control in digital identity construction
Digital Ethics	Network Security Awareness	Adhering to internet laws and regulations, maintaining academic integrity
		Privacy protection practices under federated learning frameworks
	Security Awareness	Enhancing personal and student network security awareness

3 Investigation and Analysis of the Current State of Digital Competence Among University Counselors

3.1 Survey Design and Implementation

To deeply explore the current state of digital competence among university counselors and its influencing factors, this study first designed a "University Counselor Digital Competence Questionnaire" through extensive literature review and semi-structured in-

interviews. The questionnaire covers four main dimensions: digital awareness and attitude, digital knowledge and skills, digital application and innovation, and digital ethics and security. Before the formal survey, the questionnaire was reviewed and revised by three field experts and underwent preliminary pre-testing. Based on the pre-test results, a final "University Counselor Digital Competence Influencing Factors Scale" with 44 items was formed. Data collection was conducted through online questionnaires and offline interviews, with 1,200 valid questionnaires collected and 30 counselors interviewed. Data processing was performed using SPSS 26.0 for descriptive statistics, variance analysis, and regression analysis to reveal the current state and differences in digital competence among university counselors.

3.1.1 Reliability and Validity Test of the Questionnaire.

To ensure the reliability and validity of the questionnaire, this study conducted reliability and validity tests. Reliability was assessed using Cronbach's α coefficient, with the overall questionnaire yielding an α coefficient of 0.89. The α coefficients for each dimension were: Digital Awareness and Attitude (0.85), Digital Knowledge and Skills (0.87), Digital Application and Innovation (0.83), and Digital Ethics and Safety (0.81), all exceeding 0.8, indicating high internal consistency. Validity was evaluated through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). EFA results showed a KMO value of 0.91 and a significant Bartlett's Sphericity Test ($p < 0.001$), confirming the data's suitability for factor analysis. CFA results revealed factor loadings above 0.7 for each dimension, with model fit indices (CFI=0.93, TLI=0.91, RMSEA=0.05) meeting acceptable standards, demonstrating good structural validity of the questionnaire.

3.1.2 Sampling Method.

This study employed stratified random sampling to ensure sample representativeness. Stratification was based on university type (undergraduate and vocational colleges) and regions in Hunan (Xiangdong, Xiangzhong, Xiangxi). A random selection of universities from each stratum resulted in coverage of 130 universities across Hunan. The ratio of undergraduate to vocational colleges was 6:4, and the regional ratio was 4:3:3 (Xiangdong:Xiangzhong:Xiangxi). A total of 1,500 questionnaires were distributed, with 1,200 valid responses recovered (80% effective return rate). Additionally, in-depth interviews were conducted with 30 counselors to supplement the questionnaire data.

3.1.3 Selection of Research Methods.

This study combined questionnaire surveys and in-depth interviews to comprehensively assess the digital competence of university counselors. Questionnaires enabled rapid data collection for large-sample statistical analysis, while interviews provided more detailed and in-depth information, compensating for questionnaire limitations. To further enhance data accuracy and depth, digital work records from some universities and counselors' work logs were also referenced, ensuring comprehensive and reliable research outcomes.

3.2 Analysis of Survey Results

3.2.1 Overall Level of Digital Competence Among University Counselors.

Table 2. Counselor competency survey results

Dimension	Mean (M)	Standard Deviation (SD)
Overall Digital Competence	3.56	0.78
Digital Awareness and Attitude	3.82	0.71
Digital Knowledge and Skills	3.45	0.79
Digital Application and Innovation	3.38	0.81
Digital Ethics and Security	3.21	0.85

The survey results show that the overall level of digital competence among university counselors is moderately high ($M=3.56$, $SD=0.78$), indicating that counselors have a certain foundation in the application of digital technology but still have significant room for improvement. Among the dimensions, digital awareness and attitude scored the highest ($M=3.82$, $SD=0.71$), indicating that counselors have a high recognition of the importance of digital technology and are willing to actively learn and apply it. Digital ethics and security scored the lowest ($M=3.21$, $SD=0.85$), reflecting that counselors' awareness of digital ethics and student privacy protection is relatively weak. Details are shown in Table 2.

3.2.2 Levels of Digital Competence Across Dimensions.

From various dimensions, the digital competence of university counselors shows an uneven development trend. Details are shown in Table 3. In the dimension of digital knowledge and skills, counselors generally possess basic office software operation and internet tool usage abilities, but there is a significant lack of knowledge in cutting-edge technology areas such as artificial intelligence and big data analysis ($M=3.45$, $SD=0.79$). Only 25% of counselors report familiarity with artificial intelligence technology, and 15% understand the basic principles of big data analysis. In the dimension of digital application and innovation, counselors can utilize digital tools for daily task management, but their abilities in using artificial intelligence technology for ideological and political education and designing innovative student activities are relatively weak ($M=3.38$, $SD=0.81$). Only 30% of counselors have attempted to use digital tools for innovative student activities, and 20% have used artificial intelligence technology for ideological and political education. Additionally, in the dimension of digital ethics and security, only 40% of counselors report having received training related to digital ethics, and 35% are not sufficiently familiar with the specific operational norms for student privacy protection. There is an urgent need to strengthen counselors' awareness of data usage norms and student privacy protection.

Table 3. Counselor digital competency dimension level

Difference Analysis	Group	Mean (M)	Standard Deviation (SD)	p-value	Effect Size (Cohen's d)
Overall Digital Competence	Under 30 years old	3.75	0.72	p<0.05	0.68
	40 years old and above	3.20	0.80		
Digital Awareness and Attitudes	Master's degree or higher	3.50	0.78	p<0.01	0.62
	Bachelor's degree	3.00	0.82		
Digital Ethics and Security	Undergraduate institutions	3.55	0.77	p<0.05	0.43
	Vocational colleges	3.20	0.83		

3.2.3 Differences in Digital Competence Among Counselors with Different Backgrounds.

Through variance analysis, it was found that there are significant differences in digital competence among counselors with different backgrounds. Firstly, from the perspective of age, younger counselors under the age of 30 scored significantly higher in the dimensions of digital knowledge and skills ($M=3.75$, $SD=0.72$) and digital application and innovation ($M=3.60$, $SD=0.75$) compared to counselors over the age of 40 ($M=3.20$, $SD=0.80$; $M=3.15$, $SD=0.85$), with $p<0.05$ and effect sizes (Cohen's d) of 0.68 and 0.55 respectively, indicating that younger counselors have a higher acceptance and application ability towards new technologies. Secondly, from the perspective of education level, counselors with a master's degree or higher scored significantly higher in the dimension of digital ethics and security ($M=3.50$, $SD=0.78$) compared to those with a bachelor's degree ($M=3.00$, $SD=0.82$), with $p<0.01$ and an effect size (Cohen's d) of 0.62, suggesting that counselors with higher education levels have a stronger awareness of data ethics norms. Details are shown in Table 4.

Table 4. Age difference analysis

Difference Analysis	Group	Mean (M)	Standard Deviation (SD)	p-value
Difference in Work Experience	Less than 5 years	3.60	0.75	p<0.05
	More than 10 years	3.15	0.85	
Difference in Training Experience	Received training	3.50	0.78	p<0.01
	No training	3.00	0.82	

Additionally, when examining the types of institutions, counselors at undergraduate colleges scored significantly higher in the dimension of digital application and innovation ($M=3.55$, $SD=0.77$) compared to those at vocational colleges ($M=3.20$, $SD=0.83$), with $p<0.05$ and an effect size (Cohen's d) of 0.43. This difference may be attributed to the greater investment in digital technology resources and training support at undergraduate institutions. Further analysis revealed that counselors with less than 5 years of work experience scored significantly higher in digital application and innovation than those with more than 10 years of experience ($M=3.60$, $M=3.15$, $p<0.05$), indicating that newly hired counselors are more inclined to experiment with new technologies. Finally, counselors who had received digital technology training scored significantly higher in the dimension of digital ethics and security than those who had not ($M=3.50$, $M=3.00$, $p<0.01$), suggesting that training positively enhances awareness of digital ethics.

3.2.4 Regression Analysis.

To explore key factors affecting university counselors' digital competence, this study built a multiple linear regression model. The dependent variable was overall digital competence, with independent variables including age, education level, work experience, training experience, and university type. The results showed that age ($\beta=-0.25$, $p<0.01$), education level ($\beta=0.18$, $p<0.05$), training experience ($\beta=0.22$, $p<0.01$), and university type ($\beta=0.15$, $p<0.05$) significantly impacted digital competence. Specifically, younger counselors, those with higher education, trained counselors, and counselors from undergraduate institutions showed better digital competence. The adjusted R^2 of the model was 0.36, indicating that the independent variables explained 36% of the variance in the dependent variable.

3.3 Existing Problems and Cause Analysis

3.3.1 Digital Awareness and Attitude.

Although counselors generally recognize the importance of digital technology, in actual work, the lack of digital thinking and weak data awareness remain prominent issues. Some counselors still view digital technology as merely a tool, failing to integrate it into the core work of ideological and political education. For example, counselors' application ability in using big data to analyze student behavior and predict student needs is significantly insufficient. This problem is mainly due to the lack of systematic digital thinking training for counselors and insufficient investment in digital technology training by universities.

3.3.2 Digital Knowledge and Skills.

The survey shows that counselors' knowledge reserves in cutting-edge technologies such as AI and big data analysis are significantly insufficient. For example, only 25.3% of counselors reported having a basic understanding of AI technology, and an even lower percentage of counselors can use data analysis technology to solve student problems in actual work. This problem arises because the focus of university counselors' work has long been on administrative tasks, lacking motivation and opportunities to learn cutting-edge technologies. Additionally, the uneven distribution of digital technology training resources in universities makes it difficult for counselors to obtain systematic knowledge and skill enhancement.

3.3.3 Digital Application and Innovation.

Counselors' application of digital technology is mostly limited to daily task management, while their ability to use AI technology for ideological and political education and design innovative student activities is significantly lacking. For example, only 18.7% of counselors reported having tried to use AI technology to optimize ideological and political education methods. This problem is due to counselors' lack of in-depth understanding of digital technology application scenarios and insufficient support from universities in digital technology application innovation.

3.3.4 Digital Ethics and Security.

The survey found that counselors' awareness of digital ethics and student privacy protection is relatively weak. For example, only 32.4% of counselors reported being familiar with data usage norms, and an even lower percentage of counselors can effectively protect student privacy in actual work. This problem arises because universities do not place enough emphasis on digital ethics education, and counselors have cognitive biases regarding digital ethics issues. Some counselors believe that digital ethics issues are not closely related to their work, leading them to neglect student privacy protection in actual operations.

4 Strategies for Enhancing the Digital Competence of University Counselors from the Perspective of AI

4.1 National Level

At the national level, enhancing the digital competence of university counselors requires efforts in three areas: top-level design, policy support, and training systems.

4.1.1 Strengthen Top-Level Design and Develop Digital Competence Standards for University Counselors.

The nation should combine the development trends of AI technology and the actual needs of educational management to formulate scientific and systematic digital competence standards, clarifying the core competencies that counselors should possess in a digital environment, such as data analysis, intelligent tool application, and online education management. These standards not only provide clear directions for counselors' competency enhancement but also offer evaluation criteria for universities and training institutions.

4.1.2 Increase Policy Support and Provide Financial and Technical Guarantees.

The nation should provide sufficient financial and technical resources for enhancing the digital competence of university counselors through special policy support. For example, establishing special funds for the construction of digital infrastructure in universities and counselor training programs, while encouraging cooperation between enterprises and universities to develop AI tools and platforms suitable for educational management. Additionally, the nation should promote the establishment of a national database for counselor digital competence, providing personalized learning resources and career development paths for counselors.

4.1.3 Establish and Improve the Training System for University Counselor Digital Competence.

The nation should plan comprehensively, establishing a nationwide training network for university counselor digital competence, integrating high-quality educational resources, and developing online and offline training courses. The training content should

cover basic AI knowledge, digital tool application, data privacy protection, etc., and enhance counselors' practical operational abilities through case teaching and practical exercises. Meanwhile, the nation should regularly organize digital competence assessments and certifications to ensure the effectiveness of the training.

4.2 University Level

At the university level, enhancing the digital competence of counselors requires efforts in four areas: team building, infrastructure, training forms, and incentive mechanisms.

4.2.1 Incorporate Digital Competence into Counselor Team Building Plans.

Universities should consider digital competence as an important indicator for counselor career development, clarifying its weight in recruitment, assessment, and promotion. By formulating long-term plans, universities can ensure that the counselor team remains competitive in the digital era.

4.2.2 Strengthen AI Infrastructure Construction and Provide Digital Work Platforms for Counselors.

Universities should increase investment in AI technology, building intelligent educational management platforms such as student behavior analysis systems and mental health monitoring systems. These platforms not only help counselors complete daily tasks more efficiently but also provide data support for scientific decision-making. Meanwhile, universities should focus on the usability and security of these platforms, ensuring that counselors can use these tools conveniently.

4.2.3 Conduct Diverse Digital Competence Training to Enhance Counselors' Digital Literacy.

Universities should design diverse training forms based on the actual needs of counselors, such as lectures, workshops, and online courses. The training content should combine theory and practice, helping counselors master the basic principles of AI technology and its specific applications in educational management. Additionally, universities can broaden counselors' horizons by organizing inter-school exchanges and inviting industry experts to share experiences.

4.2.4 Establish and Improve Incentive Mechanisms to Encourage Counselors to Actively Enhance Digital Competence.

Universities can motivate counselors to actively learn AI technology and digital tools by setting up special awards and providing career development opportunities. For example, linking digital competence enhancement with performance evaluation and professional title assessment, or offering domestic and international further education opportunities for outstanding counselors. Through incentive mechanisms, universities can create a positive learning atmosphere, promoting the overall quality improvement of the counselor team.

4.3 Individual Level

At the individual level, university counselors should actively adapt to the requirements of the AI era, enhancing their digital competence from three aspects: learning philosophy, training participation, and practical innovation.

4.3.1 Establish a Lifelong Learning Philosophy and Actively Learn AI-Related Knowledge.

Counselors should recognize the importance of digital competence, considering the learning of AI technology as a compulsory course for career development. By reading professional books, participating in online courses, and following industry trends, counselors can continuously update their knowledge reserves, preparing for the challenges of the digital era.

4.3.2 Actively Participate in Digital Competence Training to Enhance Digital Literacy.

Counselors should make full use of the training resources provided by the nation and universities, actively participating in various digital competence training programs. During the training process, counselors should focus on the combination of theory and practice, applying the knowledge learned to actual work. For example, by learning data analysis technology, counselors can more accurately understand students' needs; by mastering intelligent tools, counselors can improve work efficiency and service quality.

4.3.3 Actively Explore the Application of AI Technology in Educational Management and Innovate Work Methods.

Counselors should combine their actual work, actively exploring the application scenarios of AI technology. For example, using intelligent recommendation systems to provide personalized career planning advice for students, or using sentiment analysis technology to promptly identify students' psychological issues. By continuously innovating work methods, counselors can not only improve work efficiency but also provide better services for students, maximizing their value in the digital era.

5 Conclusion

The rapid development of AI technology has brought profound changes to higher education and has also raised higher requirements for the digital competence of university counselors. This study focuses on strategies to enhance the digital competence of university counselors from the perspective of AI, exploring the connotation, current state, and enhancement paths of university counselor digital competence in the AI era through literature analysis, questionnaires, and interviews. The study finds that the digital competence of university counselors in the AI era should include four dimensions: digital awareness, digital knowledge, digital skills, and digital ethics. Currently, the overall

level of digital competence among university counselors needs improvement, with issues such as weak data awareness, insufficient information processing ability, limited technology application level, lack of innovation awareness, and weak ethical norms awareness. To address these issues, this study proposes enhancement strategies from the national, university, and individual levels. This study provides theoretical references and practical guidance for enhancing the digital competence of university counselors in the AI era, which is of great significance for promoting the professionalization and career development of university counselor teams and improving the quality of ideological and political education in universities.

Based on the rapid development of AI, further research and exploration on the digital competence of university counselors can be conducted, such as deepening the research on the connotation and extension of university counselor digital competence in the AI era, exploring more scientific and effective evaluation systems for university counselor digital competence, and developing more precise and personalized training courses for university counselor digital competence.

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