

Enhancing Career Competency Of Vocational Tourism Students In Nanjing For AI-Integrated Workplaces: A Theoretical Analysis

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Abstract: *The rise of smart tourism is reshaping the skill requirements for tourism management students in vocational higher education, placing increasing emphasis on adaptability to technological change. As artificial intelligence (AI) becomes more embedded in industry practices, it is also transforming the expectations of occupational competence. However, the ways in which AI supports or enhances career readiness remain underexplored. This study develops a conceptual model of AI-enabled career competencies using a theoretical framework, complemented by qualitative interviews to refine and validate the model. Key dimensions emerging from the analysis include AI training, awareness, application, and ethical considerations. Learning ability is identified as a mediating factor, while organizational culture plays a moderating role.*

Insights from the interviews offer a grounded view of the opportunities and constraints faced by institutions in embedding AI into tourism education. The study not only extends the understanding of occupational competency from a technological perspective but also highlights practical pathways for improving AI-related curriculum design, strengthening partnerships between universities and industry, and informing educational policy. Future work could build on this foundation using quantitative approaches to test the model's broader applicability.

Keywords: Career Competence; Vocational Tourism Students; AI-Integrated Workplaces; Learning Ability; Organizational culture; Nanjing.

1. INTRODUCTION

1.1 Research Background

Artificial intelligence (AI) is transforming the global tourism industry, with technologies such as intelligent customer service, automated itinerary planning, unmanned hotels, and data analytic reshaping operational models [1]. This shift not only enhances service efficiency but also redefines competency requirements, demanding AI awareness, technical proficiency, and ethical considerations from professionals [2].

As a major tourism hub in China, Nanjing is rapidly integrating AI-driven solutions such as personalized recommendations, smart tour guides, and automated customer services [3,6]. However, vocational education in tourism management still relies on traditional teaching models, failing to equip students with the necessary competencies for AI-integrated workplaces[3,10]. This blanket in AI awareness, application skills, and professional ethics hinders their employ-ability and career development [4].

1.2 Research Statement

The rapid integration of Artificial Intelligence (AI) is reshaping the tourism industry in Nanjing, revolutionizing smart scenic spot management, personalized marketing, and service innovation[5]. AI-powered technologies such as facial recognition, visitor flow monitoring, and intelligent customer service systems are enhancing operational efficiency and customer experience. However, this transformation imposes new competency requirements on tourism professionals, highlighting a growing gap between industry needs and vocational education curricula.[6]. Traditional tourism management education remains largely theory-driven, with limited emphasis on AI-related skills and practical training, leading to a disconnect between graduates' competencies and the AI-integrated workplace[7,8]. To bridge this gap, vocational education must adapt by incorporating AI training, fostering industry collaboration, and aligning curricula with emerging workforce demands.

This study aims to construct a systematic framework for enhancing the career competence of vocational tourism management students in AI-driven workplaces. It examines how AI training, AI awareness, AI application, and AI ethical considerations influence career competence through the mediating role of learning ability and the moderating effect of organizational culture [9,10]. By addressing this gap, the study seeks to provide theoretical insights and practical strategies for optimizing vocational education in the AI era.

This study is based on a theoretical analysis method and focuses on the mechanism of the impact of AI technology on occupational competence, with the following core research questions:

RQ1: How can AI empower professional competence?

RQ2: How does learning ability mediate this?

RQ3: How does organizational culture moderate the impact of AI on career competence?

RQ4: How can vocational education and corporate training be optimized for AI?

1.3 Research Gap

Despite the widespread interest in the impact of AI technology on career development, the mechanism of action by which it empowers occupational competencies has not yet been systematized[11,13]. Existing research has mostly focused on the impact of AI on the job market and skills demand, and lacks a theoretical framework of how it specifically shapes occupational competencies [12]. While the mediating role of learning competencies has been emphasized, the specific pathways in the context of AI are not yet clear [13,14]. Organizational culture, as a key environmental factor, has a significant impact on the adoption of AI technology and the shaping of occupational competence, but related research is still insufficient [15,16,17]. In addition, current research mostly relies on empirical methods and lacks systematic theory construction. Based on the theoretical analysis method, this study constructs a framework of AI-enabled occupational competence and conducts preliminary validation in combination with interview studies to fill the theoretical gap and provide practical guidance[18,19].

This gap between ability and demand not only affects students' career development, but also restricts the talent supply efficiency of enterprises in intelligent transformation [13, 40]. Therefore, higher vocational colleges and universities need to narrow this gap by optimizing curriculum design, strengthening university-enterprise

cooperation and enhancing students' technical and ethical literacy, so as to create more favorable conditions for students' employment and development in the AI era [20,21,22].

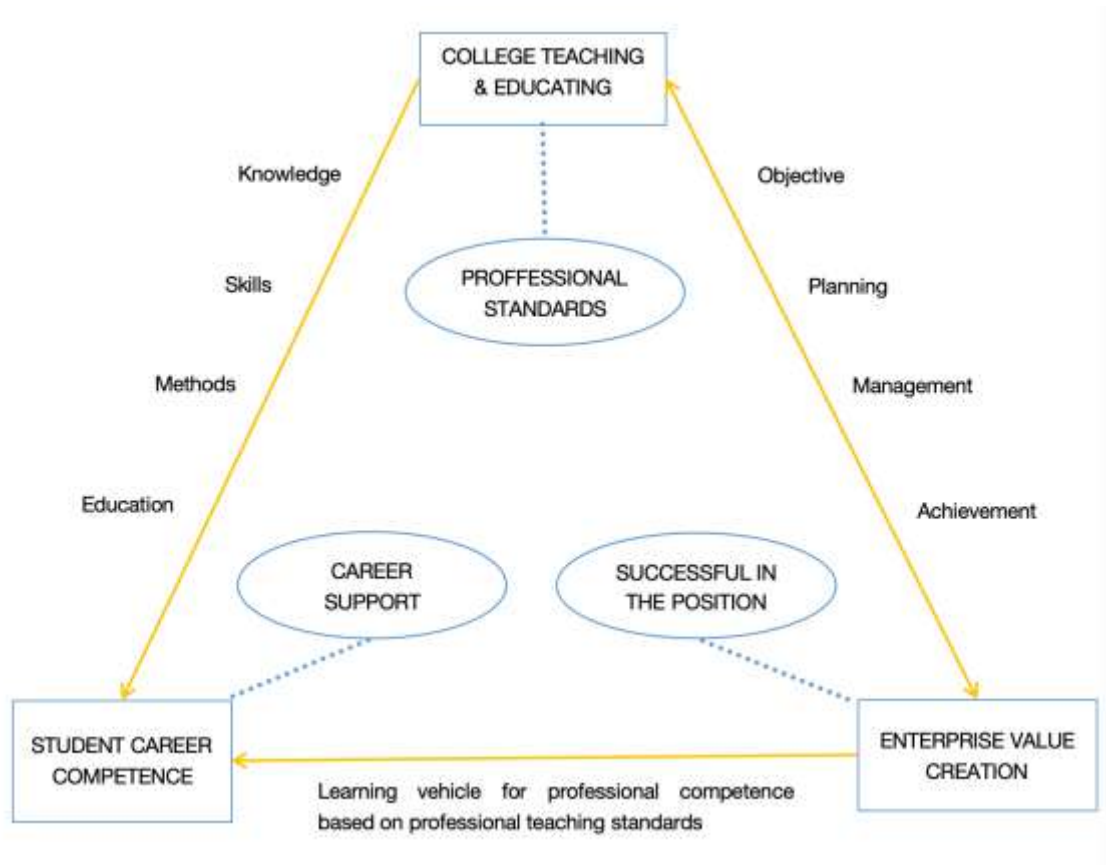


Fig. 1 Existing Educational Model of Higher Vocational Tourism

1.4 Research Significance

This study aims to develop a systematic framework for enhancing career competence in AI-integrated tourism workplaces by identifying critical skill gaps and examining the influence of AI-related factors on students' professional development. By expanding the applicability of career competence theory in AI-driven contexts, the research fills an important gap in vocational tourism education, which has yet to systematically integrate AI competencies into its curriculum[23]. The findings provide empirical evidence for designing AI-driven training models, improving ethics education, and strengthening industry-academia collaboration, offering practical guidance for vocational institutions and tourism enterprises[18,19]. Moreover, while this study focuses on Nanjing, its insights can be extended to other AI-driven tourism economies, supporting broader efforts in policy development, curriculum reform, and workforce training[24,25,26].

2. LITERATURE REVIEW

2.1 Underlying Theories

While there is a continuous and deep integration of AI and careers, we help students develop their career competencies from the perspective of higher education institutions and enterprises based on social cognitive

career theory [27], lifelong learning theory [28] and career competence theory [29], and the technology acceptance model [30].

2.1.1 Social Cognitive Career Theory (SCCT)

Social Cognitive Career Theory (SCCT) emphasizes the interaction between personal factors (e.g., abilities, traits) and environmental factors (e.g., support, barriers) in shaping career development [31]. In AI-integrated workplaces, students' AI learning ability, self-efficacy, and career goal setting are crucial for enhancing career competence.

This study applies SCCT by proposing that AI training and practice can strengthen students' self-efficacy, improving their adaptability in the intelligent tourism industry. Additionally, organizational culture, as an external factor, influences students' motivation and career pathways. By optimizing educational systems and industry support, this study helps students develop clear AI-related career goals and enhance their competitiveness in AI-driven workplaces [32].

2.1.2 Lifelong Learning Theory (LLT)

Lifelong Learning Theory (LLT) emphasizes that learning should continue throughout life to adapt to evolving societal and professional demands [33]. In AI-integrated workplaces, continuous learning of AI technologies is essential for enhancing career competence.

The LLT fosters students' interest in AI can enhance their willingness to engage in lifelong learning, thereby improving their ability to adapt to intelligent workplaces in the research[34]. Additionally, organizational culture plays a crucial role by providing learning resources and practical opportunities, helping students maintain their career competitiveness in AI-driven environments. By integrating LLT, this study suggests optimizing vocational education systems and strengthening AI skills training to ensure students' sustainable career development in the intelligent tourism industry (UNESCO, 1972).

2.1.3 Career Competence Theory (CCT)

Career Competence Theory (CCT) emphasizes that an individual's career success depends on their knowledge, skills, attitudes, and ability to adapt to the environment [35]. In AI-integrated workplaces, traditional competency requirements have been redefined, requiring students to develop stronger AI awareness, technical application skills, and ethical considerations to adapt to industry transformations.

This study applies CCT by identifying AI training, AI awareness, AI application, and AI ethical considerations as key factors influencing students' career competence, with learning ability as a mediating variable [36]. Additionally, organizational culture serves as a moderating factor, shaping how students translate acquired skills into career competence. By constructing a systematic framework, this study provides strategies to optimize vocational education in tourism management, enhancing students' competitiveness in AI-driven tourism industries [37].

2.1.4 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) emphasizes that perceived usefulness and perceived ease of use are key factors influencing individuals' acceptance of new technologies [38,39]. In AI-integrated workplaces, students' acceptance of AI technologies directly impacts their career competence development.

The study uses TAM to suggest that AI training, AI awareness, and AI application shape students' perceptions of AI's usefulness and ease of use, ultimately fostering their learning motivation and skill development. Additionally, organizational culture serves as a moderating variable, shaping students' acceptance and practical application of AI technologies [40,41,42]. Based on TAM, this study develops a career competence enhancement framework to optimize vocational education in tourism management, improving students' competitiveness in AI-driven tourism industries (Venkatesh & Davis, 2000).

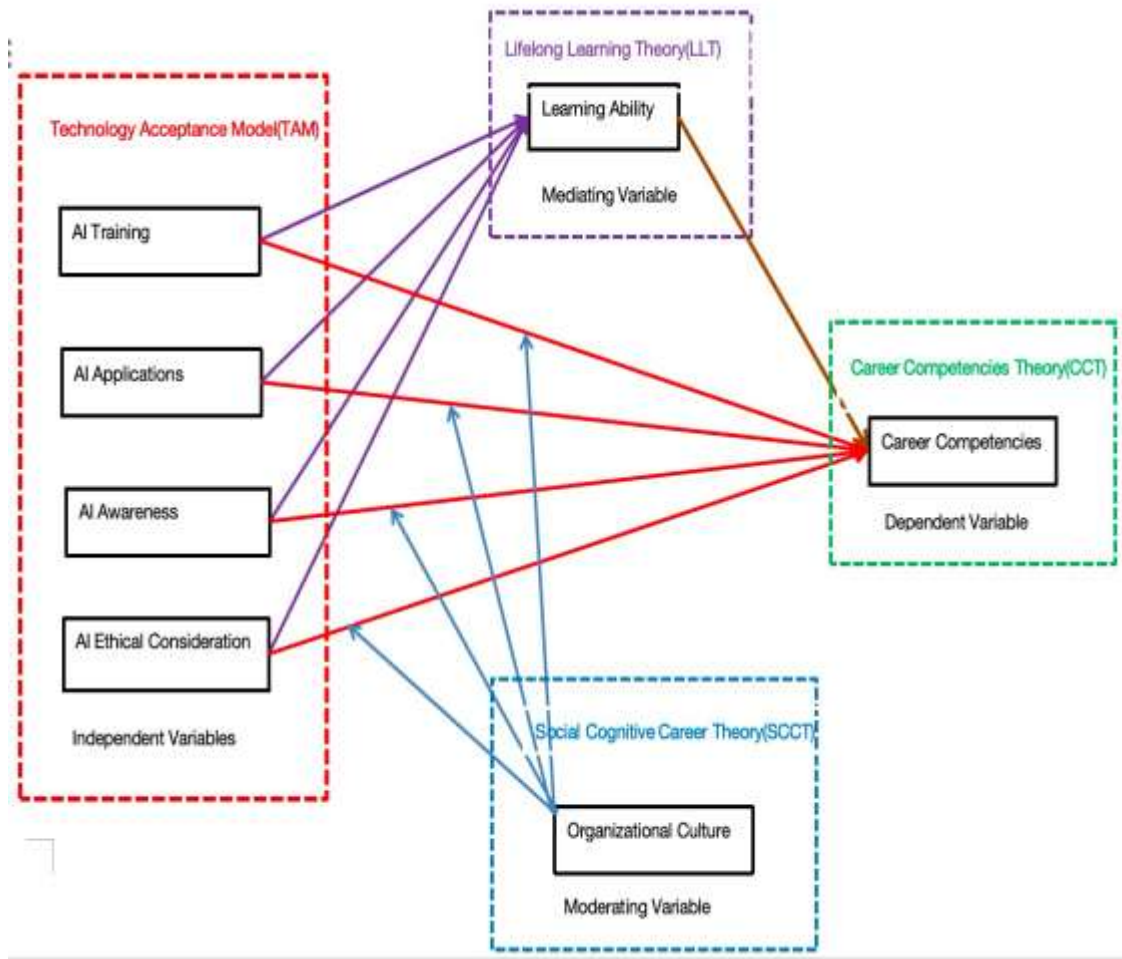


Figure2: Theoretical Framework

Table1: Theory and Factors

Theory	Factor
Social Cognitive Career Theory	1.Self-efficacy

	2.Outcome Expectations 3.Personal Goals
Lifelong Learning Theory	1.Learning Motivation 2.Learning Environment 3.Continuous learning
Career Competence Theory	1.Knowledge 2.Skills 3.Attitude 4.Personal
Technology Acceptance Model	1.Perceived Usefulness 2.Ease of use 3.Attitude Toward Using 4.Behavioral Intention to Use

2.2 AI and Career Competence in Tourism Industry

The widespread application of Artificial Intelligence (AI) is reshaping the tourism industry, placing new demands on the professional competence of practitioners[43,44].The application of AI technology in areas such as intelligent scenic area management, precision marketing, and intelligent customer service not only improves the operational efficiency of the industry, but also prompts changes in the demand for job skills[45,46]. Traditional tourism managers need to have basic AI cognitive and application skills, such as data analysis, smart tool operation and AI ethical considerations, in order to adapt to the demands of an intelligent workplace[47]. In addition, the introduction of AI emphasizes interdisciplinary competencies, such as technology adaptability, critical thinking and innovation, which poses new challenges to the vocational education system[48]. Therefore, exploring how AI affects tourism industry career competencies and optimizing vocational education models to develop talent that meets the industry's needs has become a core topic of current research.

2.3 Integration of AI in Nanjing Vocational Tourism Education

Nanjing vocational tourism students have obvious structural deficiencies in their vocational abilities, making it difficult to fully match the actual needs of Artificial Intelligence (AI)-driven enterprises [37, 49]. Nanjing vocational students lack systematic training in the operation and application of Artificial Intelligence (AI) technology, and are unable to meet the technical demands of their positions [38,50]. Moreover, the learning habits and self-divineness of vocational students are relatively weak, making it difficult for them to keep up with the pace of technological updates in the industry [39,52]. In Artificial Intelligence (AI) application scenarios in the tourism industry, problems such as data privacy protection require practitioners to have a high sense of professional ethics. However, higher vocational colleges and universities have less coverage of this in their curriculum, and students' insufficient knowledge of AI-related ethical issues may lead to their neglect of social responsibility in real work [29, 51]. Modern enterprises pay more attention to employees problem-solving and teamwork abilities in real-life scenarios, but higher vocational colleges and universities rely too much on theoretical teaching, and students' practical experience is insufficient, especially their ability to perform poorly in AI application situations [29, 53, 54]. The learning content of vocational students is relatively single and lacks

the cultivation of comprehensive quality, which makes it difficult to meet the expectations of enterprises for innovation ability [55].

3. RESEARCH METHODOLOGY

3.1 Research Design

This study adopts theoretical analysis method (theoretical analysis method) to construct a theoretical framework of AI-enabled occupational competence and combines it with an interview study (interview study) for preliminary validation in order to enhance the explanatory power and practical relevance of the theory. Firstly, by systematically combing the Technology Acceptance Model (TAM), Social Cognitive Career Theory (SCCT), Lifelong Learning Theory (LLT) and Career Competency Theory (CCT), we explore how AI technology affects occupational competency and identify the mediating role of learning ability and the moderating role of Organizational culture. Second, based on the theoretical derivation, a model of the mechanism of action of AI-enabled occupational competence is constructed in order to reveal the pathways through which AI training, AI awareness, AI application, and AI ethical considerations influence occupational competence. Finally, in order to enhance the practical support of the theoretical framework, relevant enterprises and universities in the Nanjing tourism industry are selected to conduct interviews to analyse the impact of AI technology application on occupational competence, and to conduct preliminary validation of the rationality of the theoretical framework [56,58]. The research design balances theoretical construction and practical exploration, laying the foundation for subsequent empirical research.

3.2 Research Process

This study is carried out according to the process of literature combing - theory construction - interview verification to ensure the systematic and scientific nature of the study. The whole study was divided into three phases.

3.2.1. Literature Combing

Based on existing relevant studies in the fields of professional competence, AI technology application and organizational behaviour, the path of AI's influence on professional competence is systematically analyzed [57,59]. Focus on how AI training, AI awareness, AI application and AI ethical considerations shape occupational competence, and identify the mediating role of learning ability and the moderating role of Organizational culture in conjunction with the Technology Acceptance Model (TAM), Social Cognitive Career Theory (SCCT), Lifelong Learning Theory (LLT) and Career Competence Theory (CCT).

3.2.2. Theory Construction

Based on the literature review and theoretical derivation, the theoretical framework of AI-enabled occupational competence is constructed to clarify the core variables and their relationships [60,61]. The framework assumes that AI technology enhances occupational competence by affecting learning ability, while Organizational culture plays a moderating role in the process. This phase mainly uses theoretical analysis to ensure the logical rigour and academic contribution of the theoretical framework.

3.2.3. Interview Validation and Optimization

In order to enhance the practical support of the theoretical framework, practitioners and educators from Nanjing tourism-related enterprises and universities were selected to conduct interviews to understand the actual impact of AI technology application on occupational competence[62,84]. The interview data are used to test the applicability of the theoretical framework and to revise and optimize the framework based on the feedback.[63,85] For example, the interviews may reveal practical challenges in AI training for companies, or identify the role of Organizational culture in facilitating or hindering AI application, thus further refining the theoretical framework.

Through this research process, this study establishes a close connection between theoretical construction and practical exploration, provides a more explanatory theoretical model for the study of AI-enabled occupational competency, and lays the foundation for subsequent empirical research [32,64,85].

3.3 Interview Design

This study adopts the interview method to supplement the research framework of theoretical analyses and to verify the mechanism of action of AI-enabled professional competence [65,84,85]. The interviews covered teachers of higher vocational colleges and universities, corporate managers in the tourism industry, policy makers, and tourism management students in higher vocational colleges and universities to explore how to enhance students' occupational competence in the smart tourism industry from a multilevel perspective [66,84,85]. The interviews focused on six core elements, namely AI training, AI awareness, AI application, AI ethical considerations, learning ability and Organizational culture, and were semi-structured to ensure both theoretical guidance and in-depth exploration of practical experience.

3.3.1 Interview Subjects

The following four categories of interviewees were selected for this study to gain a comprehensive understanding of the current status of professional competency cultivation of tourism management students in higher vocational colleges and to explore the optimization path:

Table2: The Subjects of Interview

Interviewee	Subjects
Teachers of higher vocational colleges and universities	These are course leaders and teaching backbones of tourism management majors to understand the current situation of curriculum design, AI training implementation and students' vocational competence cultivation.
Tourism industry business managers middle and senior managers of tourism enterprises, including hotels, travel agencies, online travel platforms, etc.	Focusing on the industry's demand for AI skills and occupational competency standards.
Policy makers	The experts from education or industry-related organizations, to understand the direction of policy-

	level guidance for higher vocational education and the smart tourism industry.
Tourism management students in vocational colleges and universities, including current students (sophomores and juniors) and alumni who have already done internships or graduated for 1-2 years	They are focusing on their knowledge of AI technology, course learning experience, and internship and employment adaptation.

The diversified selection of interview subjects helps to comprehensively analyse the cultivation path of vocational competence from the education end, enterprise end and policy end, and optimize the practical applicability of the theoretical framework.

3.3.2 Interview Questions

The interview questions are centred on how AI technology empowers career competency, combining six core variables and setting corresponding questions for different respondents.

Table3: Interview Questions

Relationship	Interviewee	Interview Questions
AI Training and career competence	Teachers	Does the school currently offer AI-related courses or training? Are there industry partnerships to develop AI skills?
	Business managers	Do companies provide AI training for their employees? What are the requirements for AI skills when hiring?
	Students	What AI training have you received at school? Is the existing curriculum considered sufficient?
AI awareness and learning ability	Teachers	Does the school encourage students to take the initiative to learn AI skills? What support measures are in place?
	Business managers	How can working employees improve their AI awareness? What are the drivers for learning AI?
	Students	Are you actively focusing on the application of AI in the tourism industry? What are the main challenges encountered in the learning process?
AI application and career development	Teachers	Does the school introduce AI technology in practical training or internship? Are students able to apply AI skills in practice?

	Business managers	What are the main AI technologies currently used in the industry? Do new employees have the relevant competences?
	Students	Have you used AI tools in your internship or part-time job? What are your expectations for future career development?
AI ethical considerations	Teachers	Does the school cover AI ethics education in the curriculum? Are students concerned about AI ethics?
	Business managers	How do enterprises avoid the ethical risks of AI applications? What are the norms for employees' AI use?
	Students	What is your understanding of AI ethics? Have you encountered any related problems in your study or practice?
Organizational culture and professional growth	Teachers	Does the school promote a culture of learning and innovation to facilitate students' adaptation to AI changes?
	Business managers	How do companies build a culture that helps the application of AI technology? Are employees encouraged to innovate?
	Students	Do you think the culture of the school or internship organization supports the learning and application of AI technology?

3.3.3 Interview Method

This study adopts semi-structured interview, which guides the interviewees to explore in depth the impact of AI technology on career competence through open-ended questions, while ensuring the comparability of the interview data [67,84,85]. For different groups of respondents, a combination of in-depth interviews and focus group interviews was adopted. Individual in-depth interviews were conducted with teachers, business managers and policy makers to gain detailed insights into industry needs, education practices and policy directions; while students were interviewed in a combination of group and individual interviews, focusing on their perceptions and career development expectations of AI training while ensuring in-depth exploration of individual experiences. All interviews were audio-recorded and transcribed, and anonymize with the consent of the interviewees to ensure data authenticity and privacy protection[68,84,85].

3.3.4 Data Analysis Method

This study used Thematic Analysis (TA) to collate and summarized the interview data in order to systematically identify and distil key themes [69,84]. Firstly, the audio recordings of the interviews were transcribed in text and initially classified to ensure the completeness and analysability of the data. Subsequently, in conjunction with the theoretical framework of AI-enabled career competency, the interviews were compared to identify points of consistency and discrepancy, and the theoretical assumptions were revised or optimized accordingly [70,85].

Ultimately, through in-depth analysis of the interview data, this study not only verifies the applicability of the theoretical framework, but also further reveals the specific paths of AI technology in shaping occupational competence, providing more instructive suggestions for vocational education reform and industry practice.

4. FINDINGS

4.1 Conceptual Model of AI-enabled Professional Competence

This study optimizes the conceptual model of AI-enabled occupational competence based on theoretical analysis and interview data. The theoretical analysis shows that AI technology affects occupational competence through four key factors: AI training, AI awareness, AI application, and AI ethical considerations, while learning ability plays a key role as a mediator variable. as a mediator variable, while Organizational culture plays a moderating role in this process.

Interview results further validate this theoretical framework and provide practical support. Teachers and industry experts generally agreed that AI technology has become an integral part of the smart tourism industry, and that students who lack the relevant skills and adaptability will struggle to meet the industry's needs [71,80]. In addition, business managers emphasized that AI training and AI application experience are crucial to employees' professional growth, while AI ethical perceptions affect their sense of responsibility and decision-making ability in the real world [72,73]. Students' interview feedback shows that there is a difference in their degree of AI awareness and skill level, and the improvement of learning ability can effectively bridge this gap and improve their career competitiveness in an intelligent environment. Meanwhile, the openness, innovativeness and learning atmosphere of corporate culture directly affect students' acceptance of AI technology and their career growth path[74,79].

Integrating the theoretical analysis and interview data, this study adjusts and optimizes the original conceptual model to reflect more comprehensively the mechanism of the influence of AI technology, individual ability and organizational environment on occupational competence, and to provide theoretical support for the reform of vocational education and industry practice.

4.2 Mechanisms of AI Training, AI Awareness, AI Application, and AI Ethical Considerations

Theoretical analyses suggest that AI training, AI awareness, AI application, and AI ethical considerations are core factors that influence professional competence. The interview data further validated the role of these factors in real-world contexts. Teachers and industry experts pointed out that systematic AI training can help students master core technologies and improve their employment competitiveness, while higher AI awareness prompts students to take the initiative to learn cutting-edge knowledge and enhance their ability to adapt to future work [75,82,83]. Business managers emphasized that practical AI application experience is the key to enhancing professional competence, and that employees are better equipped to meet the work demands of the smart tourism industry by accumulating skills through practice. In addition, AI ethical considerations are widely recognized as an important factor affecting professionalism, with interviewees believing that an understanding of issues such as AI ethics, data privacy and fairness can help to enhance the normality and sustainability of professional behaviour.

The interview results confirm that the mechanism of action of AI-enabled professional competence is not only reflected at the level of skill acquisition and application, but also includes the transformation of individuals' thinking and the shaping of their sense of responsibility. Therefore, schools and enterprises need to consider these four factors comprehensively when cultivating talents, in order to build a more complete vocational competence cultivation system.

4.3 The Mediating Role of Learning Competencies

Learning ability plays a key mediating role in the process of AI technology influencing occupational competence. Theoretical analyses suggest that AI training, AI awareness, AI application, and AI ethical considerations can further contribute to occupational competence by enhancing individuals' learning ability [27,76,81,82]. Interview data supported this inference. Teachers pointed out that students with strong learning ability can acquire AI-related skills faster and proactively adapt to industry changes, while business managers believe that employees who can continue to learn and flexibly cope with new technologies have more advantages in career development [77,81,87]. The results of the student interviews also show that their acceptance and application of AI is closely related to their own learning ability, and students who are good at self-learning and exploration tend to show higher career competence.

Validated by the interview data, this study further clarifies the mediating mechanism of learning ability, i.e., AI-related factors indirectly enhance an individual's occupational competence by enhancing his or her learning ability. This finding emphasizes the importance of vocational education and corporate training in developing students' active learning, critical thinking and interdisciplinary integration skills.

4.4 Moderating Role of Organizational Culture

Organizational culture plays a key moderating role in AI-enabled career competencies[23]. Theoretical analyses point to the ability of innovative, learning and ethically oriented cultures to promote the acceptance of AI technologies, the development of learning competencies and the normalization of professional behaviors, respectively [78,84]. Interview results further confirmed this mechanism of action. Business managers emphasized that innovative cultures can motivate employees to actively explore AI technology and improve their technical application ability; learning cultures can create an environment of continuous learning and enhance individual learning ability and adaptability; and ethically oriented cultures can help to regulate AI application and enhance professional ethics and social responsibility [79,85,86].

Interviewed teachers and students also generally agreed that Organizational culture has a significant impact on the acceptance and depth of application of AI technology.[29,83,87] In a school environment that encourages technological innovation and lifelong learning, students are more likely to develop professional competencies that respond to the needs of the smart tourism industry [35,82]. Therefore, based on theory and interview data, this study further emphasizes the key moderating role of Organizational culture in vocational education and business practice, providing a new perspective for optimizing the talent cultivation model.

5. DISCUSSION

5.1 Main Findings and Theoretical Significance of the Study

This study constructed a conceptual model of AI-enabled occupational competence based on the theoretical analysis method, and further validated and optimized the theoretical framework through interview studies. It was found that AI training, AI awareness, AI application and AI ethical considerations are the key factors influencing professional competence, and that learning ability plays an important mediating role, while Organizational culture plays a moderating role. The interview data further support this theoretical finding and provide new insights at the specific application level [80]. For example, teachers and business managers agreed that systematic AI training and practical application is a core way to enhance professional competence, while student interview feedback also indicated that high AI awareness and strong learning ability significantly enhanced their ability to adapt to industry demands.

In addition, the interview results revised and supplemented some of the theoretical assumptions. While the original theoretical framework mainly emphasizes the direct contribution of AI training to occupational competence, the interviews indicate that the actual effect of AI training relies on students' learning initiative and environmental support, and that purely technical training is not sufficient to comprehensively enhance occupational competence. Meanwhile, feedback from business managers and policy makers suggests that the impact of Organizational culture is not only reflected in the level of support for AI applications, but also involves the shaping of the learning climate and the normative requirements of professional ethics. These interview findings bring the theoretical framework closer to reality and improve its explanatory power and applicability.

In summary, the theoretical significance of this study lies in constructing and optimizing the theoretical framework of AI-enabled occupational competence, and at the same time supplementing the key influencing mechanisms through the interview study, so as to make the theoretical model more practically instructive, and to provide a theoretical basis for talent cultivation for higher vocational colleges and enterprises.

5.2 Comparison with Existing Studies

Based on theoretical analyses and combined with interview data, this study provides an in-depth exploration of the influence mechanism of AI-enabled career competence, and expands the research perspective and methodology compared with existing studies. While existing studies mostly focus on the impact of AI technology on the labour market and occupational structure, this study explores how AI shapes students' competence development paths from the perspective of individual occupational competence, and proposes four core factors, namely, AI training, AI awareness, AI application and AI ethical considerations[80]. The interview data further validate the real-world impact of these factors, such as business managers emphasizing that AI application skills in real-world work scenarios are far more important than theoretical knowledge, and teachers pointing out that improving AI awareness can enhance students' resilience to technological change [86,87].

In addition, regarding the mediating role of learning competence, most of the established studies only discuss its direct contribution to occupational competence, while the interview data in this study reveal a more complex path of action. The interview results indicate that factors such as AI training and AI awareness indirectly affect occupational competence through enhancing learning competence, a finding that enriches the perception of the role of learning competence in the process of AI-enabled occupational competence.[29,84] Meanwhile, this study

further explores the moderating role of Organizational culture, which has received less attention in the existing literature. The interview data revealed that an innovative culture facilitated the in-depth application of AI technology, a learning culture enhanced students' active learning ability, and an ethical culture ensured the normative application of AI technology.

5.3 Points of Innovation

The main innovation of this study lies in the combination of theoretical analyses and interview studies, which makes the theoretical framework of AI-enabled occupational competence more explanatory and realistic and instructive [53]. While traditional occupational competency research mostly uses quantitative methods to measure influencing factors, this study constructs a logical and clear conceptual framework through theoretical analysis and uses interview data to validate and optimize the model, which enhances the reliability of the theoretical derivation [47,83]. For example, the interview data not only support the influence of AI training, AI awareness, AI application and AI ethical considerations on occupational competence, but also reveal the ways in which learning ability and Organizational culture play a role in real-world situations, filling the gap between theoretical research and practical application.

In addition, the interview data of this study reveals the current real-world challenges of AI-enabled vocational education in higher vocational colleges and enterprises, such as the existence of a disconnect between AI training content and industry needs, and the general lack of students' AI awareness[70]. Compared to traditional studies that only analyse vocational competency at the theoretical level, this study combines the interview findings with more targeted recommendations, such as optimizing AI curriculum design and enhancing industry-school cooperation. This dual path based on theory construction and interview validation not only enhances the theoretical contribution of the study, but also its practical value.

5.4 Research Limitations and Future Directions

Although this study constructed and validated the conceptual model of AI-enabled occupational competence through theoretical analysis and interview research, there are still some limitations[61]. The interview samples were mainly from teachers, students and some business managers in higher vocational colleges and universities, with limited sample coverage, which may affect the generalizability of the research findings[44]. Future research can expand the interview subjects, such as adding policy makers and managers of different types of enterprises, to obtain a more comprehensive view.

This study adopts a qualitative research methodology, and although the interview data provide support for the theoretical framework, further quantitative research is needed to verify the generalizability and applicability of the model[39,60]. In the future, questionnaires or experimental studies can be used to quantitatively analyse the extent to which AI training, AI awareness, AI application, and AI ethical considerations specifically affect professional competence, and to test the mediating and moderating effects of learning ability and Organizational culture[42,81]. In addition, with the continuous development of AI technology, its impact on occupational competence may keep changing, and future research should dynamically adjust the theoretical framework and combine longitudinal research methods to explore the long-term mechanism of AI-enabled occupational competence.

6. CONCLUSION

6.1 Research Summary

This study constructed a conceptual model of AI-enabled occupational competence based on the theoretical analysis method, and validated and optimized the theoretical framework through interview studies. It was found that AI training, AI awareness, AI application and AI ethical considerations are the key factors affecting occupational competence, in which learning ability plays a mediating role, and Organizational culture has a moderating effect on the impact of AI technology-enabled occupational competence[83]. Compared with traditional career competency research, this study combines interview data to make the theoretical analyses more valuable for practical guidance. The interview results further reveal the real challenges currently faced by tourism management students in higher vocational colleges in the process of adapting to AI technology, such as the mismatch between AI training content and industry demand, and the students' insufficient knowledge of AI, etc., and these findings provide an important real-world basis for the study's conclusions[85].

6.2 Theoretical Contributions and Policy Recommendations Contributions

6.2.1 Theoretical contributions

The theoretical contribution of this study not only lies in the construction of a conceptual model of AI-enabled occupational competency, but also in the supplementation of the practical perspective through the interview study, which makes the theoretical framework more explanatory and application value. The interview data support and optimize the mediating role of learning competencies, revealing how different Organizational cultures (innovative, learning, ethically oriented) influence the role of AI technologies in professional competency development, which provides a more refined theoretical basis for subsequent research[86,87]. In addition, the interview study makes up for the shortcomings of traditional theoretical analyses in application scenarios and ensures that the findings can be integrated with actual vocational education and industry needs.

6.2.2 Policy Recommendations

Based on the research findings, this study puts forward the following policy recommendations: first, higher vocational colleges and universities should optimize the AI curriculum system, strengthen the docking between AI training and industry demand, and enhance students' practical application ability. Second, schools and enterprises should strengthen cooperation and build a talent training model that integrates 'industry-university-research' to improve students' professional competence in the smart tourism industry. Third, a good Organizational culture should be created to encourage innovation and lifelong learning to promote students' adaptation and application of AI technology. Fourth, government and industry organizations can formulate AI education policies for higher education institutions and provide resource support to ensure the sustainable development of AI-enabled vocational education.

6.3 Research Limitations and Future Directions

Although this study verifies the mechanism of AI-enabled vocational competence through theoretical analyses and interview studies, there are still some limitations. Firstly, the interview samples are mainly from teachers, students and business managers in higher vocational colleges and universities, and future research can expand

the interview subjects, such as policy makers and technical experts, to enhance the applicability of the research findings. Second, this study adopts a qualitative research methodology, and although the interview data provide practical support for the theoretical framework, it is still necessary to further validate the universality and impact of the model by combining it with quantitative research. In the future, questionnaires or case studies can be used to empirically analyse how AI training, AI awareness, AI application and AI ethical considerations specifically affect professional competence. In addition, as AI technology continues to evolve, future research should dynamically adjust the theoretical framework and adopt longitudinal research methods to explore the long-term development trend of AI-enabled occupational competency.

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