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Functional Review, Challenge Response and Transformation Path of Tourism Management Education from the Perspective of Generative Artificial Intelligence

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Abstract: In the context of an era where generative artificial intelligence is reshaping knowledge production and dissemination, the digital transformation of tourism management education curricula has emerged as an inevitable trend. Currently, AIGC poses four challenges to tourism management education: First, the challenge of imbalance between students' cognitive needs and educational supply; Second, the challenge to educational concepts; Third, the challenge to ethical and moral education in colleges and universities; Fourth, the challenge to the digital transformation of curriculum. In response to the aforementioned challenges, this paper proposes the following development strategies: First, revisit the fundamental essence of education and redefine the role positioning of both teachers and students. Second, facilitate the digital transformation of courses to enhance tourism management teaching. Third, reinforce the study and education of ethics and morality while clearly delineating the usage boundaries of AIGC. These measures aim to achieve a qualitative leap from "technological integration" to "deep fusion", thereby nurturing composite tourism management talents capable of meeting the demands of the intelligent era.

Key words: Generative Artificial Intelligence,Tourism management education,Digital transformation

1. Introduction

Currently, artificial intelligence (AI) technology is advancing at an unprecedented pace. In particular, the emergence of generative artificial intelligence (AIGC), exemplified by models such as ChatGPT, has been recognized as one of the most disruptive technologies of this era [1].AIGC, as a prominent technology within the domain of machine learning, has exhibited substantial application value in addressing both fundamental text tasks, such as translation and refinement, and more complex tasks, including text generation and natural language processing [2].It not only redefines the paradigm of knowledge content creation but also instigates a transformative wave across the educational landscape.This influence is especially pronounced in tourism management education, spanning from the intelligent planning of travel routes and the analysis of tourist demands to the design of virtual scenic area tour guide.AIGC is permeating the entire industry chain, thereby compelling the tourism management talent training system to expedite its innovation.

The "New Generation Artificial Intelligence Development Plan" released by the State Council explicitly highlights the importance of leveraging intelligent technologies to advance the reform of talent cultivation and teaching methodologies, thereby establishing a novel educational system [3].The "Implementation Plan for the Action of Empowering and Enhancing Industry and Education in Vocational Education (2023-2035)," jointly issued by the National Development and Reform Commission and other relevant departments, highlights the importance of fostering the integration and innovation of AI with other specialized disciplines [4],it can be seen from this that the integrated development model of "AI + education" is imperative.Many majors related to tourism management are also exploring the integration of AIGC into their curricula.

At present, the application of AIGC in the field of education has played a positive role in improving teaching quality, talent cultivation, and the reform of educational models,however, excessive reliance on AIGC has also introduced several potential risks, such as being detrimental to the development of students' autonomous abilities and critical thinking skills [5], triggering risks of data security and privacy leakage [6], academic ethics risks, and weakening the teacher-student relationship [7].These problems are more concrete in tourism management education.

The field of education serves as the main battlefield for talent cultivation. In the face of the current rapid development of AIGC, tourism management education needs to keep pace with The Times.How to enjoy the dividends of technology while avoiding risks, and how to promote the reform of the tourism management education system through the reconstruction of the curriculum system, the innovation of teaching methods and the construction of ethical norms, and cultivate compound talents who are proficient in industry knowledge and have the ability to apply AI [8], have become important issues that need to be explored urgently.

2. Literature Review

2.1 The concept definition of AIGC

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From the "Turing Test" proposed by British mathematician and father of computer science Alan Turing in 1950 to artificial intelligence technologies represented by deep learning since the 21st century, AI has rapidly matured and been widely popularized in just a few decades [8].At present, the academic community has not reached a consensus on the definition of AI, but its notable feature is the ability to apply "human-like" thinking in various fields [8].AIGC refers to the inheritance of the "human-like" thinking ability of AI technology.On this basis, it continuously learns, trains and simulates with the help of big data, high computing power and large algorithms, optimizes internal parameters, and thus approaches the human thinking mode more closely.It demonstrates strong creativity and practicality in specific application fields such as language processing, image recognition, video and music generation [5].

2.2 The current research status of AIGC in the field of education

Currently, numerous studies have demonstrated that AIGC has played a significant auxiliary role in various domains, including teaching, research, creation, medical services, and law [8], especially in the knowledge-intensive field of higher education [3], for instance,in the field of law, this technology can assist in analyzing a vast number of legal provisions and precedents.In the medical professional field, it can assist in analyzing medical images and helping with disease diagnosis.In the professional field of tourism, it plays a significant role, especially in tourism planning, tourism product recommendation, and tourism product creativity [4].AIGC not only infuses a significant intelligent technology dividend into higher education but also serves as a crucial catalyst for integrating university research, enhancing teaching quality, nurturing well-rounded talents, and facilitating the reform of university education [3].

However, research has found that compared with science and engineering, AIGC has a more intense impact on liberal arts teaching [5].For example, in the field of tourism management, the absence of a comprehensive "AI-driven tourism management education" model could hinder students' development in acquiring professional knowledge, fostering innovative thinking, and applying specialized skills. This may consequently result in a misalignment between the cultivation of tourism management talents and societal demands [4].Although previous studies have expounded the logical relationship, risks and governance between AIGC and education [5][9][10], the research on its empowerment of tourism education is still seriously insufficient.

3. Functions of AIGC in tourism management education

3.1 Knowledge production innovation: reshaping the knowledge system of tourism management education

Against the backdrop of the digital intelligence era, where information dissemination grows exponentially, the efficiency and models of knowledge production face new challenges. As a cutting-edge technological tool, AIGC is systematically screening, integrating, expanding, and reshaping knowledge production in the tourism management field through its unique technical advantages, driving profound changes in knowledge production models.

From the perspective of knowledge production efficiency, AIGC has significantly broken through the bottlenecks of traditional manual knowledge production. Traditional knowledge production relies on manual literature retrieval, a process plagued by inefficiencies such as time-consuming information searches and lagging knowledge updates, as well as risks of limited coverage and subjective bias. In contrast, AIGC leverages powerful algorithm models and cloud computing capabilities to automate the retrieval and intelligent screening of massive tourism management literature, industry reports, and practical cases in a short time, quickly integrating fragmented knowledge into a structured system. More importantly, AIGC possesses knowledge graph analysis capabilities, which can accurately identify research gaps and potential innovation directions in tourism management through semantic understanding and relational mining, shifting knowledge production from "experience-driven" to "data-driven" and significantly enhancing its speed and quality.

In terms of knowledge production quality, AIGC promotes the deep development of tourism management knowledge through deep learning and big data analysis technologies. On one hand, AIGC can deeply mine complex datasets such as tourism market dynamics, tourist behavior data, and industry policies and regulations, breaking through the limitations of traditional research that often stays at the surface level and revealing the deep laws and internal logic of the tourism management field. On the other hand, by constructing knowledge networks and semantic associations, AIGC systematically integrates scattered tourism management knowledge units into a logically rigorous and hierarchical knowledge system. This system is not static but continuously optimizes and iterates through interactive feedback mechanisms with users, achieving the leap in knowledge production from one-way dissemination to two-way interaction and from empirical replication to intelligent creation during continuous knowledge input and output.

3.2 Empowering autonomous learning: AIGC reshapes the learning model of tourism management education

In the digital transformation of tourism management education, AIGC, as a new type of learning aid, significantly activates learners' subjective initiative by building an intelligent learning ecosystem, pushing educational models to shift from "passive indoctrination" to "active exploration".

AIGC relies on cutting-edge technologies such as VR and AR to create multi-modal immersive learning scenarios, achieving a deep transformation of the teaching environment. Learners can use VR devices to enter highly simulated virtual scenic spots, experiencing the operation and management processes of scenic spots firsthand through multi-sensory interactions (visual, auditory, tactile), effectively breaking through the sensory limitations of traditional two-dimensional teaching. This embodied learning experience not only strengthens the concrete cognition of knowledge but also stimulates learners' enthusiasm for active knowledge exploration through situational immersion, transforming the learning process from one-way information reception to active participatory practice.

Compared with the temporal and spatial constraints of traditional teaching, the intelligent learning platform built by AIGC breaks the limitations of physical space and time, reshaping the paradigm of knowledge acquisition. Learners can access relevant materials and obtain answers anytime, anywhere through mobile terminals, cloud platforms, and other multi-terminal devices, making learning no longer confined to fixed classrooms. This flexible learning model significantly improves learners' participation, allowing them to proactively plan their learning processes according to their own rhythms and needs.

In addition, the intelligent interaction and data analysis capabilities of AIGC provide technical support for cultivating learners' autonomous learning abilities. By conducting real-time monitoring and in-depth analysis of learners' learning behavior data and knowledge mastery levels, AIGC can dynamically generate personalized learning paths and resource push plans. Meanwhile, the human-computer interaction function of AIGC guides learners to actively reflect on the learning process and adjust their learning strategies through mechanisms such as intelligent question answering and learning progress feedback. This two-way interactive learning model effectively promotes learners to transform from passive recipients of knowledge to self-planning and self-management learning subjects, and truly enhances their lifelong learning ability and professional quality.

4. The challenges of AIGC to tourism management education

4.1 Challenges of imbalance between students' cognitive needs and educational supply

In this study, questionnaires were distributed and collected via the online survey platform Wenjuanxing (https://www.wjx.cn/) to assess the cognitive needs of tourism management students regarding artificial intelligence. As a national pilot zone for digital economy innovation and development, Zhejiang Province has been actively promoting the deep integration of artificial intelligence within education. On April 25, 2025, the Zhejiang Provincial Department of Education released the "Action Plan for Promoting 'Artificial Intelligence + Education' in Zhejiang Province (2025-2029)." Consequently, this research conducted a questionnaire survey among full-time undergraduate students majoring in tourism management in the Zhejiang region using a combination of online and offline methods from May 18th to 19th, 2025. After screening out invalid data, a total of 666 valid responses were ultimately obtained. The following insights emerged from data analysis:

First, regarding the recognition of the significance of AI knowledge, 83.49% of students believe that knowledge related to artificial intelligence is relatively important for their future development. In contrast, only a small percentage of respondents consider it not very important (1.95%) or completely unimportant (1.65%) for their future growth. This suggests that the vast majority of respondents maintain a positive attitude towards artificial intelligence.

Secondly, with respect to the interest and demand for AI courses, over three-quarters of the respondents expressed a desire to acquire "practical skills in AI tools (such as the use of AIGC)" through their studies. Additionally, one-third of the participants indicated that they hope professional module courses in AI will emphasize "AI+ applications within specific professional fields." Furthermore, 64.56% of respondents showed an interest in courses that integrate artificial intelligence with tourism-related disciplines. This data suggests that a significant majority of students hold a positive attitude towards professional courses related to artificial intelligence.

Finally, regarding the current level of mastery in AI-related knowledge, 39.49% of respondents reported having acquired some applications of basic AI knowledge through self-study. The proportion of respondents who had attended relevant lectures or training (27.93%) was relatively close to that of those with no knowledge at all (22.37%). In contrast, only 10.21% of respondents indicated that they had systematically studied related courses. This suggests that the participants' understanding of fundamental artificial intelligence concepts is relatively inadequate. Furthermore, this finding aligns with results from an investigation into Python programming skills. Only 17.72% of respondents have engaged in systematic learning of Python programming, while a significant 39.19% reported having no knowledge whatsoever in this area. This highlights the pressing need for educational initiatives focused on imparting artificial intelligence knowledge and skills.

Based on the above data, it can be known that the current education of tourism management-related majors lags behind. AI knowledge has not yet been incorporated into the core ability cultivation system of tourism management majors, resulting in a situation of "strong demand but insufficient supply", especially making it difficult to meet students' compound demands for "practicality, professionalism and technicality".

4.2 Challenges of AIGC to educational concepts

With the development of AIGC technology, knowledge production has gradually shifted toward scale and standardization, reshaping the knowledge authority structure and disciplinary ecology in tourism management education. By virtue of its algorithmic and data processing capabilities, AIGC accelerates the industrialized production of knowledge, driving the transfer of knowledge authority from academic subjects to technological platforms, thus posing dual challenges to the knowledge system of liberal arts.

In terms of knowledge system construction, the intensive use of AIGC tends to lead students to form "technological dependence". Learners rely on AIGC for knowledge retrieval and analysis, falling into the framework of algorithmic thinking, which weakens their ability to think independently. When facing case analysis and solution design, they find it difficult to break through the ideas provided by AIGC, gradually losing their critical insight into industry phenomena. Meanwhile, the standardization of AIGC-generated content inhibits students' in-depth exploration and innovation of tourism management-related knowledge, hindering the renewal of the knowledge system.

At the same time, the structure of knowledge authority is also gradually changing. In teaching scenarios, AIGC has become the primary choice for students to acquire knowledge due to its advantages of real-time response and multi-source

integration, weakening the knowledge authority of teachers and the dominant position of classroom teaching. From an industry perspective, technology enterprises mastering AIGC algorithms and data are gradually controlling the discourse power of knowledge generation and dissemination, driving the transfer of knowledge authority from academic institutions such as universities to technological capital platforms. This may affect the development direction of disciplines.

4.3 Challenges of AIGC to ethical and moral education in universities

With the widespread application of AIGC, a series of ethical risks have emerged. Academic ethics serve as a crucial guarantee for the "legitimacy" of knowledge production in liberal arts disciplines like tourism management, playing a role in constraining and standardizing practices. However, AIGC's powerful and efficient knowledge production capabilities have significantly impacted the academic integrity system in liberal arts fields. On one hand, when students use AI to generate papers, homework, or competition copywriting, these are essentially plagiarized works produced by AIGC algorithms, as they are not the result of the author's own knowledge production. This undermines the need for in-depth literature reading and necessary critical thinking processes. On the other hand, when students entirely delegate knowledge production, creation, and innovation to AI algorithms, liberal arts students in fields like tourism management gradually lose their intellectual curiosity and become mere "knowledge laborers" [9].

4.4 Challenges of AIGC to curriculum digital transformation

The advent of the AI era also indicates that the digital transformation of curricula is an inevitable trend. From the perspective of current curriculum design in tourism management, partial transformations or additions have already been made, such as courses on tourism big data analysis and management, hotel management and digital operations, and tourism new media operations. However, many courses still face difficulties in transformation, primarily due to the urgent need for two key shifts in curriculum upgrading. On one hand, integrating AIGC into traditional curriculum content is relatively straightforward, but it is challenging to break the framework of traditional course content, resulting in limited changes. On the other hand, completely upgrading and reconstructing curricula based on current technological development is highly difficult, as it depends on the availability of suitable teaching materials and whether teachers have mastered new knowledge and related technologies. Therefore, in curriculum upgrading, it is necessary to re-examine the talent training programs and curriculum design for tourism management majors, guided by practical problems and current industry needs.

5.The development path of the transformation of tourism management education

5.1 Return to the essence of education

The development of tourism management education is essentially a dynamic process that constantly changes with the upgrading of information technology. In the face of the wide application of AIGC, we should not be in a state of resistance but learn to use it as an auxiliary tool to empower teaching. The essence of liberal arts education should be to adhere to ontology and a student-centered value orientation, ensuring that AIGC enhances human creativity rather than inhibits it. This requires ensuring that students' subjectivity can be stimulated in the digital age [9].

Currently, in tourism management education, the role of teachers should gradually shift from being knowledge transmitters to knowledge coordinators. This means that the core task of teachers should not be limited to the transmission of knowledge, but rather to guide students in the rational use of AI tools and to cultivate their critical thinking. This can be achieved through the following three aspects: First, train students' ability to communicate with AIGC, helping them quickly collect accurate information and creating space for their autonomous learning. Second, focus on cultivating students' ability to use AIGC to raise questions, analyze problems, and solve problems, helping to stimulate their thinking and innovation capabilities. Third, in the face of the massive amount of information brought by AI large models, teachers should strengthen the training of students' information discrimination ability and encourage them to conduct critical analysis of the knowledge produced by AIGC.

5.2 The digital upgrade of courses

With the emergence of DeepSeek, Chinese AIGC (such as DeepSeek) has taken the global lead, providing a natural advantage for universities to enhance their teaching. Therefore, in the digital upgrade of courses, the following two aspects can be considered: On the one hand, optimize the curriculum system and talent cultivation plan. Currently, the integration of AI with various majors has become a trend in education and teaching, and the tourism management major is no exception. In the face of the continuous empowerment of AI in the tourism industry, the talent cultivation plan and curriculum system of tourism management also need to be updated in a timely manner to meet the current demand for tourism talents. In addition to setting up courses related to artificial intelligence such as Introduction to Artificial Intelligence and Python Programming, it is also necessary to combine the knowledge system of this major and launch courses such as Tourism Big Data Prediction and Decision-making and the Application of Machine Learning in Tourism Management. At the same time, the form of dialogue with AIGC can also be utilized to provide ideas for the update of the talent cultivation plan and curriculum system.

On the other hand, the integration of AIGC with course content. The advent of AIGC also indicates that the way courses are taught needs to change. For instance, the imparting of conceptual content in the classroom should be reduced, and the content of assignments or assessment methods should be problem-oriented. This change in the teaching method of the course can more comprehensively and truly reflect students' comprehensive application ability of knowledge, promote students to move from "learning" to "being able to learn", and thus achieve the transformation from "giving people fish" to "teaching people how to fish".

5.3 Strengthen the study and education of ethics and morality

In the AI era, it is urgent to strengthen the learning and education of ethics and morality among students and teachers in various colleges and universities. First of all, each university should quickly clarify the usage norms of AI and add relevant regulations and provisions for the review of AI ethical issues in relevant committees such as the "Academic Ethics Committee", clearly defining the boundaries of AI usage and the feedback channels for ethical and moral issues. Fundamentally clarify the application boundaries of AI in the learning and academic research processes.

Secondly, strengthen the training and learning of teachers. Colleges and universities should promptly incorporate AI ethical literacy into teacher training. This can be achieved through organizing lectures, seminars, and teaching reflections, among other forms of training, to enhance teachers' understanding of AI technology ethical issues and enable them to make good use of AI.

Finally, strengthen the management and education of students. The advent of a new technology is bound to have a considerable impact on teaching. Colleges and universities should incorporate the ethics and morality of artificial intelligence into their talent cultivation plans or curriculum plans, helping students establish correct cognitive views, moral views and ethical awareness, especially clearly recognizing the ethical risks that AI technology may bring.

6. Conclusion

This paper explores the digital transformation of tourism management education courses in the context of generative artificial intelligence, analyzing challenges posed by AIGC, including imbalances between student needs and educational supply, lagging educational concepts, ethical education dilemmas, and transformation obstacles. In response, strategies are proposed, such as reshaping teacher-student roles, advancing curriculum digital upgrading, standardizing technological applications, and strengthening ethical education.

Looking ahead, tourism management education must continue deepening its integration with artificial intelligence, further exploring innovative applications of AIGC in personalized teaching and dynamic curriculum renewal. By establishing a more comprehensive ethical framework and technological usage system, the healthy and sustainable development of educational technology can be ensured. It is anticipated that through collaborative efforts, more composite tourism management talents adaptable to the intelligent era will be cultivated, promoting the coordinated and high-quality development of tourism education and the industry.

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