Research on the Innovation Mechanism of "Agriculture + Tourism" Talent Training Driven by Digital Technology

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Abstract. With the in-depth implementation of the rural revitalization strategy, the integrated development model of "agriculture + tourism" has become an important way to promote the transformation and upgrading of rural economy. However, the current integrated development of agriculture and tourism faces prominent problems such as insufficient talent supply and lagging training mechanism. This research based on digital technology development background, using the methods such as literature analysis, case studies and field research, systematically discusses the digital technology can assign farmers brigade innovation mechanism of talent training. It was found that digital technologies such as big data, artificial intelligence and virtual reality could effectively solve the problems of resource dispersion and insufficient practice in traditional training models. The research puts forward a four-party linkage digital talent training ecosystem of "government, university, enterprise and cooperation", and constructs an innovative training model including intelligent learning platform, virtual training system and digital authentication mechanism. Finally, optimization suggestions were put forward from three dimensions of policy support, curriculum reform and technology application, which provided theoretical reference and practical guidance for the cultivation of agricultural-tourism integration talents under the background of rural revitalization.

Keywords: digital technology; integration of agriculture and tourism; talent training; innovation mechanism; rural revitalization

1 Introduction

Since the implementation of the rural revitalization strategy, data from the Ministry of Agriculture and Rural Tourism show that in 2022, the number of tourists received by leisure agriculture and rural tourism in China has exceeded 3 billion, and the operating revenue has exceeded 800 billion yuan. Behind industry rapid development, however, there are serious short of talents. According to a survey by the China Tourism Academy, 85% of agricultural tourism enterprises are facing a shortage of professional talents, especially those who understand both agricultural production and tourism service skills[1].

The traditional talent training mode has been difficult to adapt to the new development needs. On the one hand, the talents trained by agricultural colleges focus on production technology, and lack tourism service and management ability. On the other hand, tourism college graduates lack of agricultural knowledge. At the same time, limited education and training resources and lack of practice opportunities in rural areas further aggravate the contradiction between supply and demand of talents.

2   The role mechanism of digital technology to empower the cultivation of agricultural tourism talents

2.1   Innovation of Teaching Methods

VR/AR technology: Create immersive teaching scene: Driven by digital technology, VR (virtual reality) and AR (augmented reality) technology provides a new path of immersive teaching for the cultivation of agricultural tourism talents. By constructing three-dimensional virtual scenes, students can participate in practical training projects such as rural tourism planning and home accommodation operation. For example, an agricultural college introduces a VR system to simulate the whole process of scenic spot management. Students complete practical training such as tourist diversion and emergency handling through head mounted devices, and visualize complex scenes that are difficult to realize in traditional classrooms. The practical data show that the technology improves the training efficiency by 40%, reduces the operation error rate by 25%, and solves the pain point of high cost and high risk of field training[2]. AR technology is applied in agriculture sightseeing scene teaching, by mobile scanning stack crop growth of real data, tourism interpretation, such as information, strengthen the "agriculture + services" compound ability training. The experiential learning enabled by this technology is becoming an important supplement to the practical teaching of agricultural tourism talents.

2.2   Innovation of Learning Model

Driven by digital technology, mobile learning has become an important model of agricultural tourism talent training. Using smart phones and online education platform, students can flexible use of commuting, clearance of farming, such as debris time for learning, breakthrough the traditional face-to-face class time and space constraints. The survey data showed that the completion rate of students who adopted mobile learning mode reached 78%, which was significantly higher than the average level of 65% in face-to-face courses. The practice of "agricultural tourism cloud classroom" in a province showed that the mobile micro-course (10-15 minutes per class) combined with online testing and instant feedback increased the knowledge retention rate by 32%. Especially for remote rural students, mobile learning effectively solves the problems such as inconvenient transportation and contradiction between engineering and learning[3]. The built-in AI learning assistant can also intelligently push personalized content according to the progress of students, which further improves the learning efficiency. This flexible and efficient learning method is reshaping the knowledge acquisition path of agricultural tourism talents.

2.3   Improvement of Management Efficiency

Blockchain technology provides a credible solution for agricultural tourism talent management. Built by distributed books and encryption algorithm, province agriculture tour talents block chain platform to realize the personnel files cannot be tampered with and the whole back. The platform will be the training records, qualifications, work experience and so on key information on the chain store, unit of choose and employ persons can be via a unique hash value verification certificate of authenticity, put an end to the traditional paper certificate fraud. Data show that after the operation of the platform, the efficiency of talent information verification is improved by 60%, and the accuracy of enterprise recruitment matching is improved by 45%. At the same time, the smart contract technology realizes automated skill certification and credit accumulation, and the training results of students in different institutions can be cross-platform mutual recognition. This decentralized management mode not only ensures data security, but also builds a full-chain credible system that runs through talent training, certification and employment, which provides technical support for the standardized development of talent ecology in the agricultural tourism industry.

3   Difficulties and challenges of current talent training in agricultural tourism industry

At present, the cultivation mode of agricultural tourism talents is

still in the traditional stage, which is difficult to adapt to the needs of industrial integration and digital transformation. The main problems are reflected in three aspects of curriculum system, practical teaching and teaching staff, which lead to a serious disconnect between the cultivated talents and market demand.

3.1   The Content of the Course Is Obsolete, and the Proportion of Digital Courses Is Low

The cultivation of agricultural tourism talents is still dominated by traditional agriculture or tourism management courses, and the proportion of digital related courses is less than 30%. There is a serious shortage of courses involving cutting-edge content such as smart agriculture, tourism big data, and new media marketing. For example, the major of rural tourism management in many colleges and universities still focuses on traditional travel agency operation, while ignoring the application of modern technologies such as short video marketing and AI guide systems. In addition, the course update speed is slow, and some teaching materials still use the theoretical system of 5-10 years ago, which cannot match the rapid iteration needs of the agricultural tourism industry. A survey of an agricultural university showed that only 22% of students believed that the courses learned could effectively support future employment, reflecting the huge gap between education content and practical application.

3.2   The Practical Links Are Weak, and the Integration of Production and Education Becomes a mere Formality

As an application-oriented discipline, agricultural tourism has extremely high requirements for practical ability. However, the average proportion of practical training hours in the current training system is only 15%, which is far lower than that of similar international majors (usually more than 30%). The practical teaching of most colleges is limited to visit or short-term internship, and it is difficult for students to participate in the core links such as planning and operation of agricultural tourism projects. For example, the course of "rural tourism planning" in some colleges and universities is mainly based on case analysis, lacking project drills in real scenes. In addition, school-enterprise cooperation mostly stays at the agreement level, and enterprise participation is low, which leads to the lag of training base construction and the disconnection between students 'skills and job demand.

3.3   There Is a Shortage of Teachers, and the Gap of "Double-Qualified" Teachers Is 45%

The integration of agriculture and tourism requires teachers to have both theoretical literacy and industrial practical experience, but the current gap of ** "double-qualified" teachers (with both teaching ability and industry experience) is as high as 45%**. Many teachers come from pure academic background and lack front-line agricultural tourism project operation experience, which makes it difficult to guide students to solve practical problems. For example, in leisure agriculture courses, teachers may be proficient in agricultural technology, but know little about key links such as tourism product design and customer experience optimization. Although some colleges try to introduce corporate tutors, it is difficult to form stable cooperation due to the imperfect treatment and assessment mechanism[4].

4   Optimize the curriculum system: build a knowledge framework for cultivating agricultural tourism talents to keep pace with The Times

At present, the agricultural tourism industry is undergoing digital transformation, and the traditional curriculum system has been unable to meet the needs of industry development. Firstly, the proportion of digital-related courses should be greatly increased in the professional curriculum setting, and frontier courses such as smart agriculture, digital marketing, and cultural and tourism big data should be included in the category of required courses. Specifically, special courses such as "application of agricultural Internet of Things technology", "Digital Marketing of rural tourism" and "data analysis of cultural and tourism projects" can be set up to ensure that the course content keeps pace with the latest development of the industry.

4.1   Strengthen Practical Teaching: Build a Ability Training System of "Learning by Doing"

Practical teaching is the key link of training applied talents. First of all, the proportion of practical teaching should be greatly increased, and the proportion of practical training hours should be increased from the current 15% to more than 30%. This needs to be achieved by adjusting the training program, compressing part of the theoretical class hours, and increasing the practical teaching links.

In terms of school-enterprise cooperation, it is necessary to promote the establishment of a deep cooperation mode of "school in enterprise, enterprise in school". Schools can jointly build industrial colleges with high-quality agricultural tourism enterprises, such as "Rural Tourism College" and "Leisure Agriculture Research Institute", to introduce real projects of enterprises into the teaching process. For example, the "pastoral Complex Operation training base" established by a vocational and technical college in Jiangsu in cooperation with a local well-known farm allows students to directly participate in the daily operation and management of the farm, which significantly improves students 'practical ability.

The implementation of the "project-based" teaching model is another important measure. We can link the course assessment with the real project of the enterprise, and organize students to participate in the actual work such as agricultural tourism project planning and scenic spot operation. For example, let students complete a digital transformation program of rural tourism scenic spots in groups, and be reviewed by enterprise experts. Excellent programs can be directly applied to enterprise practice.

4.2   Deepening the Integration of Production and Education: Building a Multi-party collaborative Education Ecosystem

The integration of production and education is the key to breaking the disconnect between talent training and market demand. First of all, a government-led collaborative education mechanism should be established. Local governments should issue special policies to give incentives such as tax breaks and project support to enterprises participating in school-enterprise cooperation. At the same time, an agricultural tourism talent training alliance should be established to integrate all resources and form a joint force for education.

"Order-type" training is an effective way to deepen the integration of production and education. Schools can set up customized classes according to the specific needs of enterprises, such as "leisure agriculture manager class" and "rural tourism e-commerce class", so as to realize recruitment by enrollment and employment by graduation. The employment rate of the "oriented training class for civilian dormitory administrators" in the cooperation between a university and key tourism enterprises in Zhejiang province has reached 100%, which fully proves the effectiveness of this model[5].

In addition, a resource sharing platform should be built. Build a big data center for the agricultural tourism industry to collect data such as industry demand, talent information, and teaching resources, so as to realize the precise docking between supply and demand. Establish an "agricultural tourism talent incubation base" to provide   all-round support for students to start their own businesses, such as venues, funds and technologies.

4.3   Strengthen the Construction of Teachers: Build a "double teacher and double ability" Teaching Team

The quality of the teaching staff directly determines the effectiveness of talent training. In view of the large shortage of "double-qualified" teachers, we should first improve the teacher introduction mechanism. "Special positions for industry experts" can be set up to introduce enterprise talents with rich practical experience in a flexible way. At the same time, we will improve the treatment standard of enterprise tutors and establish a special subsidy system to attract outstanding industry talents to participate in teaching.

It is also necessary to reform the teacher evaluation mechanism. We will increase the weight of practical teaching and social service indicators in the evaluation of professional titles and performance appraisal, and set up special rewards such as "famous practical teaching teachers" to encourage teachers to improve their practical teaching ability. For example, a provincial department of education has included teachers 'participation in enterprise horizontal projects and guidance for students 'innovation and entrepreneurship into the necessary conditions for professional title evaluation, which has achieved good results.

5   Conclusion and Outlook

This study focuses on the core talent bottleneck problem faced by the agricultural and tourism integration industry under the backdrop of the rapid development of digital technology. It deeply analyzes the theoretical logic of the digital integration of agriculture and tourism and the new, complex, and high-level requirements it poses for talent capabilities. Currently, the talent cultivation system lags significantly and is disconnected in terms of supply structure, training models, industry-education collaboration, and evaluation incentives, making it difficult to meet the urgent needs of the industry's digital transformation.

For this reason, this article innovatively proposes a "four-dimensional integration" talent cultivation innovation mechanism for agricultural tourism driven by digital technology at its core. The overall design is carried out from four key dimensions: the education system (cultivating at the source), the practice platform (forging capabilities), the certification and incentive system (recognizing value), and the guarantee system (environmental support), to form a closed loop. It emphasizes breaking down the boundaries between disciplines, fields, subjects, and the virtual and the real, deeply integrating knowledge from agriculture, tourism, and digital technology, integrating online and offline resources, and promoting multi-party collaboration among government, industry, academia, research, and application.

Emphasizing scenario-based and project-oriented learning, it utilizes technologies such as digital twins and virtual simulation, along with real industrial projects, to enable students to hone their ability to solve complex problems in highly simulated or real environments. Closely following the cutting-edge of technology and the trends of industrial transformation, it emphasizes the core position of digital literacy, data thinking, and cross-border integration innovation capabilities, and has established a dynamic update and long-term guarantee mechanism.

The effective implementation of this mechanism is expected to continuously supply the agricultural and rural tourism industry, which is undergoing profound digital transformation, with high-quality, multi-skilled talent teams that possess a solid sense

of dedication to agriculture, rural areas and farmers, a deep understanding of the industry, exquisite digital skills, acute innovative thinking and outstanding practical abilities. They are the key fulcrums to drive the modernization of agriculture, the intelligence of tourism and the all-round revitalization of rural areas. They will powerfully drive the agricultural and rural tourism industry towards higher added value, stronger competitiveness and greater sustainability, ultimately realizing the beautiful vision of rural revitalization featuring prosperous industries, pleasant living environment, civilized rural customs, effective governance and prosperous life.

Further directions for future research could include: the differentiated implementation strategies and effect evaluations of this innovative mechanism in different regions (such as developed and underdeveloped areas) and various types of agricultural tourism projects (such as scenic area-dependent and rural complex types); the continuous impact and mechanism adjustment of the latest developments in digital technologies (such as generative AI and the metaverse) on agricultural tourism business models and talent capability models; and how to more accurately quantify the correlation between talent cultivation investment and the improvement of industrial economic and social benefits, providing more solid empirical evidence for policy optimization. Continuously deepening the research on the innovative mechanism for digital agricultural tourism talent cultivation is of long-term and significant importance for empowering the comprehensive revitalization of rural areas and building a strong agricultural nation.

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