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Enhancing the "Digital Literacy" of Professional Teachers in Higher Vocational Education in the New Era: Value, Challenges, and Strategies

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Abstract: ***With the in-depth development of the digital economy, digital transformation has become a core driver for the reform of higher vocational education. Professional teachers are the key guarantee of vocational education quality, and their level of digital literacy directly affects the effectiveness of cultivating technical and skilled talents. This paper systematically explores the multidimensional value of enhancing the digital literacy of higher vocational teachers in the new era, and deeply analyzes the current practical challenges, including insufficient awareness and intrinsic motivation among some teachers, lack of target and practicality in training systems, inadequate systematic support for digital teaching resources, and imperfect incentive and evaluation mechanisms. In response to these challenges, this paper proposes an operational system of strategies: strengthening intrinsic motivation by fostering a digital culture and clarifying personal development paths; constructing a systematic, layered, and classified training system integrating theory and practice; promoting the construction of co-built, shared, integrated, and convenient digital teaching resource platforms; and improving development-oriented incentive and evaluation mechanisms. This research aims to provide theoretical reference and practical pathways for higher vocational institutions to promote the enhancement of teachers' digital literacy, thereby empowering the high-quality development of vocational education to better adapt to industrial upgrading and era changes.***

Keywords: Higher Vocational Education, Digital Literacy, Teacher Development, Teaching Reform, Training System.

1. Introduction

We are currently in an era of profound transformation led by digital technologies such as big data, artificial intelligence, and cloud computing. According to data released by the Ministry of Industry and Information Technology of the People's Republic of China, by the end of 2023, the scale of China's digital economy exceeded 50 trillion yuan, accounting for over 40% of GDP. This macro background presents unprecedented opportunities and challenges for higher vocational education, which bears the responsibility of cultivating high-quality technical and skilled talents for the industrial front. The digital transformation of education is no longer an option but an inevitable trend.

In this context, the competency structure of professional teachers in higher vocational education urgently needs reconstruction. Digital literacy, which refers to an individual's comprehensive ability to use digital technologies, resources, and tools effectively for work, learning, communication, and even critical thinking and innovation in a digital environment, has become a core component of teachers' professional competence. It means more than just using office software or playing PPTs; it encompasses the ability to design digital teaching, develop and integrate digital teaching resources, analyze learning situations based on data, and educate students to establish correct digital ethics and safety awareness. However, the reality is that many professional teachers in higher vocational institutions, despite having solid theoretical knowledge and superb practical skills, still face a significant "digital divide" when it comes to deeply integrating digital technology with professional teaching. Some teachers' understanding of digital technology remains at the tool level, with limited application ability, making it difficult to effectively support future-oriented digital teaching models. Therefore, systematically examining the intrinsic value of enhancing the digital literacy of higher vocational teachers, facing the real existing challenges, and exploring practical strategies are of great practical significance for promoting the connotative development and quality improvement of higher vocational education in China.

2. The Value of Enhancing Digital Literacy

2.1 Deepening Teaching Reform and Promoting Teaching Model Innovation

Enhancing teachers' digital literacy is the internal engine for triggering a classroom revolution in higher vocational education. The traditional "teacher lectures, students listen" teaching model often proves inadequate when facing vocational courses that are highly practical and rapidly updated. Teachers with high digital literacy can flexibly use various digital tools and platforms to completely change the classroom format. For example, in mechanical manufacturing courses, teachers can use 3D virtual simulation software to allow students to independently complete the disassembly, assembly, and motion simulation of complex components on computers. This process is not only safe and low-cost but can also be repeated infinitely, greatly improving learning efficiency. In business-related majors, teachers can guide students to use big data analysis tools to mine and analyze real e-commerce platform sales data, completing market research reports and seamlessly connecting learning with real work scenarios. This blended teaching model based on virtual simulation, project inquiry, and data analysis can greatly stimulate students' learning interest and initiative, cultivating their comprehensive ability to solve complex problems. Research indicates that introducing virtual simulation technology into practical training can transform abstract theoretical knowledge into intuitive, interactive visual experiences, improving students' skill mastery by an average of about 20%. Therefore, enhancing teachers' digital literacy is a key leverage point for promoting the profound

transformation of higher vocational teaching from "knowledge transmission" to "ability cultivation."

2.2 Precisely Aligning with Industrial Upgrading and Changing Talent Demands

The vitality of higher vocational education lies in its close connection with industrial development. With the advancement of national strategies such as "Made in China 2025," new formats like smart manufacturing and the Industrial Internet have put forward clear requirements for the digital capabilities of technical and skilled talents. Frontline workers not only need to operate machines but also need to be able to read data, operate intelligent systems, and perform simple program debugging. This requires higher vocational teachers to first possess these cutting-edge digital skills and awareness before they can integrate them into the curriculum and teaching content. For instance, in CNC technology majors, if teachers are proficient in CAM software and the networked data transmission technology of CNC machine tools, they can teach students how to achieve the entire digital process from design to manufacturing. In modern agricultural technology majors, if teachers understand IoT technology, they can guide students on how to use sensors to collect environmental data and achieve intelligent control of irrigation and fertilization. Higher vocational teachers must become "early perceivers" of industrial technological changes, and their digital literacy determines whether the students they train can smoothly connect to future workplaces, avoiding the dilemma of "being outdated upon graduation." Therefore, enhancing teachers' digital literacy is a strategic need to ensure the quality of talent cultivation in higher vocational education and serve regional economic and social development.

2.3 Promoting Students' Holistic Development and Cultivating Lifelong Learning Abilities

The ultimate goal of digital literacy education is not only skill impartation but also the cultivation of thinking and literacy. A teacher with high digital literacy can subtly cultivate students' information literacy, critical thinking, and innovation ability during the teaching process. For example, when assigning project assignments, teachers can require students to retrieve information online and guide them on how to distinguish the authenticity and value of information, rather than simply "copying and pasting." In group collaborations, teachers can introduce online collaborative document tools to cultivate students' teamwork skills in a digital environment. More importantly, the teacher's own active learning and effective application of digital technology is itself the best demonstration of a lifelong learning attitude for students. In an era of rapid technological iteration, teaching students how to use digital tools to learn new knowledge autonomously and adapt to new changes is far more important than imparting fixed knowledge itself. By enhancing their own digital literacy, teachers can better play the role of guides for students' digital survival and development, laying a solid foundation for the sustainable development of their careers.

3. Challenges in Enhancing Digital Literacy

3.1 Teachers' Digital Awareness and Intrinsic Motivation Need Strengthening

Although the wave of digitalization is sweeping across various industries, among higher vocational teachers, there is still a widespread problem of weak digital awareness and insufficient intrinsic motivation for transformation. The reasons are multifaceted: Firstly, some senior teachers are long accustomed to the traditional teaching model of "one textbook, one piece of chalk, one blackboard," forming a stable teaching comfort zone and having fear of difficulty and path dependence towards learning new technologies. They believe digital technology is just "flashy" and not as solid as traditional teaching methods. Secondly, higher vocational teachers, especially professional teachers, often undertake heavy teaching, practical training guidance, and research tasks, with limited time and energy. Without strong external incentives, it is difficult for them to actively invest a lot of time in systematically learning new digital technologies and teaching methods. A survey of 5 higher vocational institutions showed that over 40% of teachers believed digital technology was merely an "auxiliary means" or "optional tool" for teaching, and only less than 15% of teachers believed it was a "core force triggering teaching transformation." This cognitive limitation is the primary barrier hindering the improvement of teachers' digital literacy.

3.2 Lack of Targeted Training and Disconnection from Practical Application

In recent years, education authorities and higher vocational institutions at all levels have organized numerous training sessions on information technology, but the results are often unsatisfactory. The current training system mainly has two major shortcomings: First, the "one-size-fits-all" phenomenon is serious. Training content is mostly focused on general information technology tools, such as advanced PPT functions, basic operations of online teaching platforms, etc., lacking customized content deeply integrated with different professional fields. A teacher in automotive repair and a teacher in accounting need completely different digital tools and teaching scenarios, but the training they receive may be largely the same, leading to "learning without application." Second, the training model emphasizes theory over practice. Many trainings are still conducted in the form of expert lectures. Although the information volume is large, there is insufficient time for teachers to actually operate and design digital teaching plans themselves. For "lecture-style" training, participating teachers are often "excited during the lecture, but do nothing after returning," making it difficult to effectively transfer what they learned to real teaching situations, resulting in a low conversion rate.

3.3 Lagging Construction of Digital Teaching Resources and Low Platform Integration

High-quality, applicable, and convenient digital teaching resources are the foundation for teachers to carry out digital teaching. However, support in this area is still insufficient in many higher vocational institutions. On the one hand, the number of high-quality, original digital resources developed by the schools themselves is limited, and updates are slow, unable to keep up with technological development and curriculum reform. On the other hand, resources available in the market and from enterprises are relatively scattered, requiring teachers to spend a lot of time searching, filtering,

and integrating from different platforms, which is a cumbersome and inefficient process. Furthermore, a common phenomenon is that schools may have introduced multiple different teaching platforms or management systems, but these platforms do not communicate with each other, forming "information silos." Teachers need to repeatedly switch between different platforms to log in and enter data, increasing unnecessary non-teaching burdens and reducing their willingness to use digital tools.

3.4 The Guiding Role of Incentive and Evaluation Mechanisms is Not Fully Utilized

Incentive and evaluation mechanisms at the institutional level are the baton guiding teachers' behavior. Currently, the teacher assessment and professional title evaluation systems in the vast majority of higher vocational institutions are still highly skewed towards "hard indicators" such as research projects, paper publications, and competition awards. Teachers' investment and achievements in digital teaching, such as developing a high-quality online course, designing a series of innovative virtual training projects, or effectively using big data to improve teaching effectiveness, are often difficult to quantify or carry very low weight in the evaluation system. This evaluation orientation of "emphasizing research over teaching; emphasizing tradition over innovation" seriously dampens teachers' enthusiasm for improving digital literacy and engaging in teaching reform. When investing great effort in teaching innovation cannot be recognized in professional promotion and performance distribution, teachers' passion naturally diminishes. Therefore, establishing an incentive mechanism that can scientifically measure and fully recognize teachers' digital teaching achievements is key to breaking the current predicament.

4. Strategies for Enhancing Digital Literacy

4.1 Strengthening Intrinsic Drive: Fostering a Digital Culture and Clarifying Personal Development Paths

To enhance digital literacy, the first step is to address the issues of mindset and motivation. At the institutional level, a digital teaching culture that encourages innovation and tolerates failure should be actively created. This can be done by regularly organizing activities such as "Digital Teaching Salons" and "Excellent Case Sharing Sessions," allowing teachers who have achieved results in digital teaching to share their experiences and set examples, inspiring resonance and emulation among the broader teaching faculty. Simultaneously, school management should help teachers align the enhancement of digital literacy with their personal career development plans. For example, a "Digital Literacy Growth File" can be established for each teacher, helping them clarify the digital competency standards they should meet at different development stages and formulate personalized learning and improvement plans. Make teachers realize that improving digital literacy is not to meet school requirements, but an internal need for their own professional growth, realization of teaching value, and enhancement of career competitiveness.

4.2 Restructuring the Training System: Implementing Layered, Classified, and Theory-Practice Integrated Training Models

In response to the shortcomings of existing training, systematic reform is necessary. First, implement "layered and classified" precise training. Before training, diagnose teachers' basic digital literacy and professional background, dividing teachers into different levels such as "beginner, application, innovation," and design training content with different focuses for teachers in different major categories. For example, for beginner-level teachers, focus on training in basic office software and teaching platform usage; for application-level teachers, training on micro-lecture production, data visualization, etc., can be provided; for innovation-level teachers, they can be organized to learn cutting-edge topics such as AI educational applications and educational big data analysis. Second, resolutely implement the "theory-practice integration" training model. The "workshop" style training is worth promoting, which is driven by specific teaching tasks and guided by trainers, where teachers learn by doing, collaborate in groups, and finally produce teaching plans that can be directly used in their own classrooms. This training has clear goals and strong practicality, effectively improving the conversion effect of training.

4.3 Optimizing Resource Supply: Building Co-constructed, Shared, Integrated, and Convenient Resource Platforms

Institutions should increase systematic investment and integration in digital teaching resource platforms. On the one hand, adopt a "co-construction and sharing" mechanism, encouraging teaching teams within the school, cross-institutional alliances, and even cooperation with leading enterprises to jointly develop high-quality, systematic professional teaching resource libraries, virtual simulation training projects, and open online courses. Recognize and reward excellent resource developers to form a virtuous cycle of resource construction. On the other hand, vigorously promote platform integration and data interoperability. The ideal state is to build or upgrade a unified "Smart Teaching Portal" that integrates functions such as course teaching, resource invocation, practical training management, and learning analysis into a user-friendly platform. By connecting with a data middle platform, provide teachers with data analysis reports on student learning behavior, helping teachers achieve precise teaching. Turn platforms and resources from a "burden" into an "assistant," effectively reducing teacher burden and increasing efficiency.

4.4 Improving Institutional Guarantees: Establishing Development-Oriented Incentive and Evaluation Mechanisms

The role of evaluation as a "baton" and "booster" must be fully utilized. Higher vocational institutions should clearly incorporate digital literacy into teachers' job responsibilities, performance assessments, and professional title evaluation conditions. For example, a "Digital Teaching Special Performance" award can be established to provide material rewards and honorary recognition to teachers who have achieved significant results in developing digital resources, implementing blended teaching, and using digital technology

to improve teaching effectiveness. In professional title reviews, recognition should be given to teachers who lead the construction of high-quality online open courses, win awards in informatization teaching competitions, and produce promotable digital teaching reform cases, placing them on an equal footing with traditional papers and projects. Through these institutional designs, convey a clear signal to all teachers: engaging in digital teaching reform is highly valued and will be richly rewarded, thereby guiding teachers to transform external pressure into internal motivation and actively embrace digital change.

5. Summary

In summary, in the context of the new era, enhancing the digital literacy of professional teachers in higher vocational education is a systematic project crucial to the overall modernization of vocational education. It is not only a supplement to technical ability but also a profound transformation of educational philosophy, teaching models, and teacher roles. We must clearly recognize that there are still practical challenges in terms of teacher awareness, training systems, resource platforms, and evaluation mechanisms. To solve these challenges, higher vocational institutions need to strengthen top-level design, adhere to a problem-oriented approach, and implement multiple measures. By stimulating teachers' intrinsic motivation, providing precise and effective training support, building convenient and friendly resource environments, and constructing scientific and reasonable institutional guarantees, a synergistic force can be formed to steadily and efficiently promote the overall improvement of the digital literacy of the higher vocational teacher team. Only in this way can we cultivate high-quality digital craftsmen capable of adapting to and leading future industrial development, providing a solid talent support for our country's transition from a manufacturing giant to a manufacturing power.

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