Research on the Dilemmas and Strategies for Improving Digital Literacy of University Teachers

Huanhuan Du*

School of Marxism (Law School), Tarim University, Alar City, Xinjiang, 843300
**Corresponding author: zgdu2020@126.com*

Abstract: *With the arrival of the digital age and the rapid development of information technology, digital literacy has become a fundamental ability for university teachers in both teaching and research. However, university teachers currently face many challenges in improving their digital literacy, which not only affects the quality of education and teaching but also limits the innovation and development of higher education. This paper focuses on the dilemmas and strategies for enhancing digital literacy among university teachers. It begins by analyzing the connotation of digital literacy and its importance to educational reform. Then, through an analysis of the challenges at the individual, institutional, and technological levels, the main obstacles faced by university teachers in improving their digital literacy are revealed. Finally, strategies such as strengthening teacher training and support systems, optimizing policy support and incentive mechanisms, and building collaborative learning and practice platforms are proposed, aiming to provide practical guidance and theoretical support for enhancing digital literacy among university teachers.*

Keywords: *University Teachers; Digital Literacy; Enhancement Dilemmas; Educational Reform; Strategies and Paths*

Introduction

In today's rapidly changing digital technology landscape, the process of educational informatization is accelerating, and the digital literacy of university teachers has become a key factor in improving educational quality and promoting educational reform. Digital literacy is not just about technical skills, but also involves the ability to acquire, analyze, judge, and creatively use information. As the leaders in education, university teachers' enhancement of digital literacy can not only improve their teaching effectiveness but also better meet students' needs for modern educational methods, contributing to educational innovation and transformation. However, despite the fact that digital education has become an important direction for global educational reform, university teachers in our country still face serious challenges in improving their digital literacy. Issues such as individual cognitive and capability gaps, institutional lag, and inadequate technological support limit the enhancement of teachers' digital literacy.

1. The Connotation and Importance of Digital Literacy for University Teachers

1.1 Definition and Components of Digital Literacy

Digital literacy refers to an individual's ability to effectively use digital technologies to process information and solve problems in an information-based society. It encompasses multiple dimensions, including technical, cognitive, and social competencies. Specifically, digital literacy is not just about technical skills; it also includes the ability to acquire, evaluate, process, create, and disseminate information. In this process, technical competence serves as a fundamental requirement, reflecting an individual's ability to operate computers and related devices, use digital tools, and handle information. Moreover, the ability to assess and analyze information is a core aspect of digital literacy, emphasizing an individual's capacity for effective evaluation and critical thinking, including judging the source, accuracy, and reliability of information and mastering skills in complex data analysis.

In addition to technical and cognitive abilities, digital literacy also involves content creation and dissemination capabilities. In an information society, teachers are not only recipients of information but also creators and distributors of content. Digital literacy requires teachers to use digital technologies to produce and share knowledge, supporting collaboration and interaction in education. At the same time,

social ethics and legal awareness are important components of digital literacy. With the widespread use of digital technologies, teachers need to be sensitive to and compliant with issues related to information security, privacy protection, and copyright. Lastly, digital literacy includes the ability to engage in lifelong learning, as the rapid changes in digital technologies require teachers to continually update their knowledge and skills to adapt to new technological environments[1].

1.2 The Necessity of Digital Literacy for University Teachers

In today's information-based society, the rapid development of digital technologies has brought about profound changes in education. The digital literacy of university teachers not only affects the improvement of teaching quality but also directly impacts the realization of educational equity and resource sharing. First, digital literacy is crucial for enhancing teaching quality and effectiveness. Teachers can use digital tools and platforms to design and organize courses more efficiently, enriching and making the student learning experience more interactive. Digital teaching methods, such as online platforms, virtual laboratories, and interactive teaching tools, can help teachers increase student engagement and motivation, thus improving teaching effectiveness. Additionally, with the help of data analysis tools, teachers can more accurately assess students' learning progress and adjust teaching strategies in real-time to ensure the achievement of teaching goals.

Second, digital literacy plays an important role in promoting educational equity. In the information age, the digitalization and networking of educational resources break the geographical and time constraints of traditional education. Teachers can use various online teaching platforms and digital resources to provide students with abundant learning content. This is particularly beneficial for students in remote areas, where the sharing of digital educational resources can effectively narrow the educational gap and improve educational equity.

As the process of educational informatization advances, the application of digital technologies has become an integral part of modern education. University teachers who fail to enhance their digital literacy in a timely manner will struggle to adapt to changes in the educational environment and may even find themselves at a disadvantage in a digitalized educational setting. Therefore, enhancing the digital literacy of university teachers is an essential requirement for teachers to meet the challenges of education in the new era and is key to driving the modernization of education.

1.3 The Relationship Between Digital Literacy and Educational Reform

There is a close interactive relationship between digital literacy and educational reform. The core goal of educational reform is to cultivate innovative talents who can adapt to the needs of an information-based society, and university teachers, as the executors of educational reform, must enhance their digital literacy to ensure the smooth progress of reform. Digital literacy supports the transformation of educational teaching methods, especially in terms of the changes in the roles of teachers and teaching approaches. Traditional teaching models are teacher-centered, while modern education emphasizes student autonomy, personalized learning, and interactive teaching. The introduction of digital technologies provides technical support for transforming teaching methods, allowing teachers to use new teaching methods, such as flipped classrooms, online education, and virtual labs, to achieve more flexible and diverse classroom organization.

At the same time, digital literacy also drives innovation in curriculum content and teaching methods. The use of digital tools and resources allows teachers to overcome the limitations of traditional textbooks, enabling dynamic updates to course content and the introduction of more diverse teaching methods. Digital technologies not only enrich the content of teaching but also offer new possibilities for interdisciplinary teaching and the design of innovative courses.

Digital literacy also plays an important role in the reform of educational assessment systems. Teachers can use data analysis tools to conduct real-time evaluations, provide instant feedback, and adjust teaching pace and methods accordingly. The new assessment system shifts from traditional paper-and-pencil tests to multidimensional, comprehensive evaluations, driving innovation in educational assessment methods[2].

2. Analysis of the Dilemmas in Improving Digital Literacy for University Teachers

2.1 Dilemmas at the Individual Level

The dilemmas faced by university teachers in the process of improving digital literacy are particularly prominent at the individual level, mainly in areas such as personal background, time management, and technological awareness. First, there are significant differences in the acceptance and usage abilities of digital technologies among teachers of different ages and educational backgrounds. Younger teachers typically show a higher level of acceptance towards emerging technologies. They are more familiar with various digital tools and can apply them flexibly in teaching. In contrast, older teachers often display strong resistance and difficulties when faced with digital technologies. Some teachers show little interest in learning about digital technologies, believing that the role of technology in changing teaching is limited, and they do not actively work on enhancing their digital literacy.

Second, time pressure is another important factor in the dilemmas at the individual level. University teachers have heavy daily workloads, with teaching, research, and administrative duties interwoven, making it difficult to allocate time for systematic digital literacy training. Even if some teachers are able to attend training courses, the time allocated is often insufficient, and there is a lack of long-term, continuous learning opportunities. Due to the lack of adequate practice, teachers find it challenging to effectively apply the learned technologies in actual teaching, which ultimately impacts the improvement of their digital literacy.

In addition to time and age factors, the limited understanding of digital technologies is another key dilemma at the individual level. Many teachers still view digital literacy from a basic technical perspective, considering digital tools as merely supplementary tools for teaching. They lack a comprehensive understanding of the profound impact that these tools can have on educational philosophy, teaching models, and even students' learning methods. Therefore, although some teachers are able to use tools such as electronic whiteboards and teaching platforms, they fail to fully explore the potential of these technologies in areas like teaching innovation, educational interaction, and personalized instruction. As a result, the depth and effectiveness of digital technology application are limited[3].

2.2 Dilemmas at the Institutional Level

At the institutional level, the dilemmas in improving digital literacy among university teachers are more complex, mainly manifesting in the inadequacies of teacher training mechanisms, the lack of incentive measures, and the lag in teaching management systems. First, the current teacher training systems in universities have significant flaws. Although many universities have established training courses on digital technologies, the content of these courses is generally too basic, lacking systematic structure and specificity, making it difficult to meet the needs of teachers from different disciplines and levels. The training content often focuses on the operational skills of digital tools, while neglecting how to integrate these tools into teaching philosophies, instructional design, and innovative classroom interactions. As a result, teachers often struggle to convert the skills they learn in training into effective applications in real teaching, reducing the effectiveness of the training.

The lack of incentive mechanisms is also a prominent issue at the institutional level. While universities generally have clear evaluation standards and incentive measures for teaching and research, they lack effective assessment and reward mechanisms for teachers' efforts and achievements in improving digital literacy. The application of digital technologies is often not included in the core indicators of teacher performance evaluations, leaving teachers with little intrinsic motivation to improve their digital literacy. Without corresponding incentives, teachers lack the drive to actively learn and explore new digital technologies in their daily work, which weakens the motivation to enhance digital literacy.

Moreover, the current teaching management systems and curriculum designs have not kept pace with the development of educational informatization. Most universities' teaching outlines and management processes are still relatively traditional and do not adequately consider the need for improving digital literacy. The use of digital technologies in teaching lacks systematic planning, and the role of digital technologies in course design, classroom interaction, and student evaluation has not been fully reflected[4].

2.3 Dilemmas at the Technological Level

At the technological level, the dilemmas in improving digital literacy for teachers cannot be ignored.

Despite the expanding application of digital technologies in the field of education, the rapid pace of technological updates often leaves teachers unable to keep up with the latest developments. New technologies emerge continuously, and each tool has its own unique operational methods and usage scenarios, often leaving teachers confused and uncertain when faced with multiple technological tools. Due to the lack of a systematic learning path and time, teachers find it difficult to integrate various technological platforms effectively, resulting in fragmented learning of technologies, which in turn affects their actual teaching effectiveness.

The uneven distribution of technological resources is another major technological dilemma faced by university teachers. Although many universities have started investing significant funds in introducing digital teaching resources, there are still considerable gaps in the configuration of equipment and network infrastructure. Some high-level universities can provide advanced technical support and equipment, while many smaller and medium-sized institutions have significant deficiencies in updating equipment and building technological platforms. Due to limitations in hardware and network environments, teachers often find it difficult to fully utilize the advantages of digital technologies in actual teaching, affecting the improvement of their digital literacy and teaching effectiveness.

The inadequacy of technological support systems is also one of the key problems at the technological level. In the teaching process, teachers frequently encounter technical issues such as equipment malfunctions, software problems, and unstable networks. Although some universities have established technical support departments, the capacity of technical teams and their response speed are often limited, preventing teachers from receiving timely assistance. When faced with technical difficulties, teachers are forced to rely on self-learning or the help of colleagues. This lack of systematic support not only disrupts the smooth flow of teaching but also weakens teachers' trust in and enthusiasm for using digital technologies.

3. Strategies and Pathways for Improving Digital Literacy of University Teachers

3.1 Strengthening Teacher Training and Support Systems

To effectively improve the digital literacy of university teachers, the primary task is to establish and improve a targeted digital literacy training system for teachers. The training content must be both targeted and systematic. Teachers from different disciplines and with different professional titles have varying needs for digital technologies; therefore, training courses should be personalized according to teachers' disciplinary characteristics, technical application needs, and their levels of digital literacy. For example, basic courses can help teachers master the use of common digital tools, while advanced courses should focus on how to effectively integrate digital technologies into teaching philosophy, design, and classroom interactions to promote teaching quality improvement[5].

In addition to the relevance of the training content, the methods of training should also be diversified. Universities can combine online and offline training modes, utilizing online platforms to provide flexible learning opportunities, allowing teachers to participate in courses based on their own schedules and progress. Meanwhile, offline training can enhance teacher interaction through workshops, seminars, etc., encouraging teachers to solve problems through practical operations and improve their hands-on skills and innovative thinking. Moreover, the periodicity and continuity of the training are also crucial; regular learning and practice are necessary to ensure the long-term enhancement of teachers' ability to apply information technology.

In addition to training, universities should also provide sufficient technical support resources. Establishing dedicated technical support teams is essential to promptly answer any questions that teachers encounter during the use of digital technologies and to help resolve practical problems. Universities can assign instructional technology personnel to offer one-on-one guidance and consulting services, assisting teachers in better understanding and utilizing new teaching tools.

3.2 Optimizing Policy Support and Incentive Mechanisms

Institutional support and incentive measures are critical in improving teachers' digital literacy. Universities should strengthen their focus on enhancing teachers' digital literacy at the policy level, developing and implementing relevant policies, clarifying improvement goals and requirements, and creating an atmosphere of university-wide attention.

Universities can provide financial support for teachers' digital literacy training through policy

guidance. By investing special funds, universities can ensure that teachers participate in high-quality training programs. At the same time, policies can be established requiring every teacher to complete a certain amount of digital literacy training and include it in their annual performance evaluations, clearly defining the weight of digital literacy in the assessment process, thus motivating teachers to engage in training.

Optimizing the incentive mechanism is equally important. Universities should establish a sound teacher performance evaluation system that includes the application of digital technologies as a key evaluation indicator, particularly in areas such as classroom teaching, course design, and academic research innovation. Teachers who actively participate in training and successfully apply digital tools should be rewarded and recognized, such as being selected as outstanding teachers or given priority for title promotion. These measures will enhance teachers' proactivity and ensure that the improvement of digital literacy is closely linked to teachers' career development.

Policy support should also include the rational allocation of resources related to digital literacy improvement. Universities should encourage teachers to participate in domestic and international academic exchanges and technical seminars, creating more opportunities for learning and practice. By building exchange platforms, universities can promote technical exchanges and collaborations among teachers, improving the overall level of digital literacy[6].

3.3 Building Collaborative Learning and Practice Platforms

To promote the continuous improvement of university teachers' digital literacy, building collaborative learning and practice platforms is crucial. By establishing a collaborative learning platform based on teachers' needs, supported by technological assistance and rooted in disciplinary characteristics, teachers can share experiences and exchange technical knowledge in practice, forming a collective learning synergy.

Building a collaborative learning platform for the application of digital technologies helps teachers from different disciplines and levels to improve their understanding of technological applications through shared learning and discussions. Through interdisciplinary and inter-field collaboration, teachers can inspire each other, learn from the successful application of digital technologies in other disciplines, and incorporate these practices into their own teaching. Online learning communities and forums provide platforms for teachers to share case studies and insights about digital technology applications and to discuss how to effectively integrate technological tools into teaching content and design, thus promoting the use of technology in teaching.

The collaborative learning platform should emphasize practical components, encouraging teachers to apply the digital technologies they have learned in teaching and to conduct practical technology application experiments. Through practice, teachers can not only improve their technical abilities but also optimize their teaching methods through feedback and evaluation. Regularly organizing teaching observation activities and inviting teachers from different disciplines to showcase their digital teaching achievements and share experiences will help other teachers learn from successful practices, thereby improving their digital literacy.

The construction of collaborative platforms should focus on ongoing support and feedback among teachers. Through mentorship systems and peer reviews, teachers can help each other during the process of enhancing their digital literacy, ensuring continuous progress in long-term collaborative learning. Establishing a “Digital Teaching Pioneer” program to select teachers who excel in the application of digital technologies will encourage more teachers to actively participate in improving digital literacy, fostering a positive learning atmosphere.

Conclusion

Through the analysis of the challenges in improving the digital literacy of university teachers, this paper summarizes the main issues at the individual, institutional, and technical levels. In response to these challenges, specific strategies have been proposed, including strengthening teacher training and support systems, optimizing policy support and incentive mechanisms, and building collaborative learning and practice platforms. Practice has proven that through multi-party cooperation and continuous support, teachers' digital literacy levels can be effectively enhanced, driving the modernization and innovation of university education. Future research can further explore how to develop more personalized digital literacy improvement plans based on the characteristics of different disciplines and the specific

conditions of various regions. Therefore, how to respond to rapidly changing technological transformations and ensure that teachers can continuously improve their digital literacy will be an important direction for future research.

Fund Projects

Institute of Higher Education Research, Tarim University

Project Name: Research on the Cultivation Path of Digital Literacy Driving Digital Education Development for University Teachers - A Case Study of Tarim University (TDGJYB2549)

References

[1] Wang F. (2025). Digital Technology Empowerment Pathways for Ideological and Political Course Teaching Reform in Higher Vocational Colleges. Modern Business and Trade Industry, 2025(05): 55-57.
[2] Wang J., Zhang A., Jiang X., et al. (2025). Research on the Element Model of Digital Teaching Innovation Literacy for Vocational College Teachers. Innovation and Entrepreneurship Theory Research and Practice, 2025, 8(02): 1-3.
[3] Pu X., Cao P. (2025). Can Technology Empower Students' Digital Literacy? — A Large-Scale Survey on the Digital Learning Status of Primary and Secondary Schools. Modern Educational Technology, 2025, 35(01): 98-108.
[4] Wang Z., Zhong L., Li R. (2025). Exploration of Teaching Reform in Facility Environment and Regulation Courses Based on the OBE Concept. Smart Agriculture Guide, 2025, 5(04): 139-142.
[5] Zhou M., Gan Y. (2025). Constructing a High-Quality Educational Evaluation System to Promote Educational Reform and Development. Jiangsu Education Research, 2025(02): 45-48.
[6] Tang Y., Wang Y., Liu J., et al. (2025). Teaching Reform and Practice of the "Personal Finance" Course in Higher Vocational Colleges under the Background of "Classroom Revolution". Journal of Hunan Industrial Vocational Technical College, 2025, 25(01): 101-106.