Exploring the Path of Improving Information Literacy of College Teachers under the New Situation

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Abstract. With the rapid advancement of artificial intelligence technology and the continuous deepening of higher education reform, improving university teachers' information literacy has become increasingly crucial. This article aims to explore the core elements of university teachers' information literacy, analyze the current development status from multiple dimensions, and propose strategies to enhance their information abilities. These strategies include: enhancing the information technology standard system, strengthening teachers' understanding of information literacy, enhancing their information learning skills, establishing an effective information technology evaluation mechanism, and optimizing the information equipment management platform to promote efficient integration of information resources.

Keywords: Information Literacy, Artificial Intelligence, Ability Enhancement.

1 Introduction

In the past few decades, educational informatization has played an important role in promoting educational equity, improving educational quality, driving educational innovation, and leading educational reform. Under the high attention of the Party and the state, the development process of educational informatization is still accelerating. In March 2012, the Ministry of Education issued the "Ten Year Development Plan for Educational Informatization (2011-2020)"[1] to promote the construction of educational informatization. One of the specific tasks regarding "strengthening the construction and application of digital campuses in universities" is to enhance the information technology application ability of university teachers and promote the widespread application of information technology in teaching. In June 2016, the Ministry of Education formulated and issued the "13th Five Year Plan for Educational Informatization"[2], proposing to establish and improve the standards for teachers' information technology application abilities, closely integrate ability enhancement with subject teaching, and carry out targeted training on lesson examples and teaching methods characterized by deep integration of information technology, cultivate teachers' ability to use information technology to conduct learning analysis and personalized teaching, enhance

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teachers' ability to innovate education and teaching, and make information-based teaching truly the norm of teachers' teaching activities. In April 2018, the Ministry of Education issued the "Education Informatization 2.0 Action Plan", proposing to achieve the development goal of "three full, two high, and one large" by 2022, shifting from enhancing the information technology application ability of teachers and students to comprehensively improving their information literacy[3].

Currently, with the development of artificial intelligence technologies such as big data and cloud computing, the overall level of informatization in society is gradually deepening. There are also many applications of learning tools and educational software based on artificial intelligence technology, such as Duolingo, a language learning tool software created in the United States, Grammarly, a writing aid tool, and ChatGPT, which enable people to truly experience the revolutionary impact of information technology on education[4]. However, in the current application of educational technology in domestic higher education institutions, multimedia courseware and online courseware are still the main carriers. With the continuous changes and improvements in people's ways and abilities to acquire and process information technology, new challenges and requirements have been put forward for the reform of higher education, the application of educational technology, and the improvement of teachers' information literacy level. Therefore, in the context of educational informatization and artificial intelligence era, it is necessary to further analyze the current situation and improvement path of information literacy of university teachers. This has important practical significance for improving the teaching quality of universities, building a high-quality teaching team, and strengthening the construction of teacher ethics and style.

2 The Basic Connotation of Information Literacy of College Teachers

2.1 Definition of Concept

Information literacy was first proposed by Paul Chukotsky, the president of the American Information Industry Association, in 1974. He defined it as the technology and skills that use a large number of information tools and primary sources to solve problems[5]. In 2004, the American Society for Educational Communication and Technology defined educational technology as the research and ethical practices that promote learning and improve performance through the creation, use, and management of appropriate technological processes and resources[6]. The Ministry of Education defines educational technology in the "Standards for Educational Technology Competence of Primary and Secondary School Teachers (Trial)" as the use of various theories and technologies to optimize education and teaching through the design, development, utilization, management, and evaluation of teaching and learning processes and related resources[7]. In summary, the author believes that teacher information literacy refers to the comprehensive ability of teachers to use information technology to design, develop, test, apply, and evaluate teaching processes and resources.

2.2 Main Components

Teacher information literacy mainly includes four aspects: teacher information awareness, information knowledge, information ability, and information ethics[8]. Information awareness refers to the sum of cognition, concepts, and needs generated by teachers in information activities, reflecting their sensitivity and demand for information activities; Information knowledge refers to all theories, methods, and knowledge related to information that teachers possess, including basic knowledge of information technology, information technology teaching design, information network security, and other aspects; Information capability refers to the ability of teachers to utilize information equipment and resources to acquire, process, and create new information[9]. It is an important survival ability in the information age; Information ethics refers to the ethical and moral standards that teachers and staff must follow in the information age and information activities. Information awareness is a prerequisite for the information literacy of university teachers, and information knowledge and ability are the foundation and core of their information literacy.

3 The Current Research Status of Information Literacy of College Teachers

3.1 The Development Status of Information Literacy of Foreign Teachers

The research results on information literacy in the field of education are mainly concentrated in regions such as the United States, Australia, and Japan. The American International Educational Technology Association launched the "National Educational Technology Standards for Teachers" in June 2000, which includes six aspects: technology operation and basic concepts, planning and designing learning environments and experiences, teaching, learning and curriculum, evaluation and assessment of technology application, use of technology to promote teaching performance and professional practice, and social, moral and legal humanity[10]. Australian scholars such as Cohen have subdivided the factors that affect information literacy into six parts, namely school, classroom, personal, family, social, and learning characteristics[11]. Japan has formulated the "Higher Education Information Literacy Standards", which states that teachers can develop information literacy teaching plans, learning objectives, and evaluation criteria for students based on this standard when conducting information literacy education[12].

In summary, all countries have integrated information literacy into the education and teaching process, and attach great importance to the transformation of educational technology literacy.

3.2 The Current Situation of Information Literacy among Domestic Teachers

Domestic scholars have also explored the research on teachers' information literacy. Song Quanhua and others proposed the development path of information literacy for

university teachers from the aspects of conceptual change, institutional and environmental construction, optimization of teacher knowledge structure, and innovation of training mode[13]. Yang Yan and others proposed to enhance the information literacy of university teachers by consolidating information awareness, expanding information knowledge learning, strengthening the application of information skills, strictly adhering to the bottom line of information ethics and morality, and improving the richness and effectiveness of post service training[14]. Pang Chaobo and others proposed to enhance the level of information technology through four aspects: strengthening information awareness, enhancing the construction of information infrastructure, improving information training mechanisms, and establishing incentive systems[15]. Starting from four aspects: information awareness, information knowledge, information application ability, and information ethics and security, Miao Yanan proposed a development strategy of changing teachers' concepts, innovating training models, establishing an information literacy evaluation system, and creating an information-based teaching environment[16].

In summary, most domestic scholars have recognized the practical challenges that information literacy brings to the informationization reform of higher education, and have proposed corresponding countermeasures from a macro level. However, at present, empirical exploration is still the main approach, lacking in-depth empirical investigation and research.

4 The Realistic Dilemma of Enhancing the Information Literacy of University Teachers

Using questionnaire and interview research methods, a survey and data statistical analysis were conducted on the faculty and staff group (including full-time teachers, administrative staff, teaching assistants, staff, etc.) of a medical university in Tianjin. Among them, a total of 100 teacher survey questionnaires were distributed, and 93 valid questionnaires were collected, with a questionnaire response rate of 93%. 10 teachers were interviewed individually, and the interview effectiveness rate was 100%.

4.1 The Level of Teacher Attention Needs to Be Enhanced

When asked about their understanding of cutting-edge information technologies such as cloud computing and ChatGPT, only 5.2% of teachers were very familiar with them, 90.4% said they had only heard of them but did not have a detailed understanding, and even 4.8% of teachers had never heard of them. These data indicate that most teachers do not recognize the importance of information resources in education and teaching. Influenced by traditional teaching concepts, 65.1% of full-time teachers are not proficient in computer operations and have limited levels of information resource integration during the lesson preparation stage, which requires a long preparation time.

The insufficient attention of teachers to cutting-edge information technology knowledge and the inadequate level of utilizing information technology indirectly reflect the lack of correct and long-term understanding of information technology among

some teachers, as well as the need to improve their perception and comprehension of cutting-edge information technology and information literacy.

4.2 The Quality of the Teaching Staff Needs to Be Improved

44.8% of teachers believe that they are "fully capable" of designing information-based teaching, 50.2% of teachers think that independently designing information-based teaching is "somewhat difficult", and 4.9% of teachers think that information-based teaching design is optional. From the reflection of professional teachers on their use of information technology teaching after class, 40.4% of teachers stated that they "frequently reflect", but there are still some teachers who choose to "ignore" or "not reflect" after class, indicating that the vast majority of teachers have insufficient reflection and summarization.

From this, it can be seen that strengthening teachers' information literacy and improving their information technology level are still practical challenges facing the current informationization construction work in universities.

4.3 The Strength of Platform Construction Needs to Be Improved

In terms of platform construction strength, when answering the question about the satisfaction level of teaching/office with the existing information technology facilities (such as computers, network equipment, etc.) in schools, 22.1% of teachers chose "completely satisfied", 48.4% of teachers chose "basically satisfied", 24.9% of teachers chose "difficult to meet", and 5.3% of teachers chose "unable to meet". When asked about the evaluation of the effectiveness of existing teaching platforms in schools, such as the Wisdom Tree, 20.3% of teachers rated it as "very easy to use", 60.3% of teachers rated it as "average to use", and nearly 20% of teachers were not satisfied with the school's existing teaching platform.

Therefore, it is necessary for universities to attach importance to the construction of teaching (office) platforms, guide teachers and students to actively use existing service platforms, create the best teaching and office environment, and stimulate teachers' awareness and interest in actively using platforms.

5 The Path to Improving Information Literacy of College Teachers

5.1 Establish Sound Information Technology System Standards and Strengthen Teachers' Awareness of Information Literacy

Establishing a sound information literacy system and strengthening teachers' awareness of information literacy are prerequisites for enhancing the information literacy of university teachers. In 2004, the "Chinese Teacher Education Technology Capability Standards" explicitly stated that educational technology literacy is the ability of teachers to use their own information skills to solve problems in the actual teaching process

under the guidance of educational technology theoretical knowledge, and ultimately achieve educational development goals[17]. This standard mainly sets information literacy requirements for primary and secondary school teachers. Therefore, universities should base themselves on the current situation of information construction, formulate policy documents to enhance the school's information construction and teachers' information literacy, strengthen communication and cooperation with other universities, draw on their rules and regulations and work rules, and innovate and improve information literacy documents. Universities should improve teachers' ability to obtain and apply information, regularly inviting experts and scholars in the field of educational technology/leaders of top IT companies/computer industry experts to give lectures on cutting-edge artificial intelligence technology, further stimulating teachers' motivation for information technology needs, in order to strengthen teachers' information awareness.

5.2 Strengthen Teachers' Information Learning Ability and Establish an Information Technology Evaluation Mechanism

Improving teachers' ability to reflect on learning and perfecting the information technology evaluation mechanism are prerequisites for enhancing the information literacy of university teachers. College teachers should continuously improve their learning abilities by combining online and offline methods, learning information technology through multiple channels and in all aspects, and integrating information technology into daily education and teaching work. At the same time, constantly reflect on and summarize the teaching and management work of informatization, propose improvement measures and plans, and continuously improve oneself. Establish and improve incentive mechanisms for information technology applications, and institutionalize, normalize, and standardize them to encourage teachers to actively participate in the construction of information technology education and teaching processes. On the one hand, relevant functional departments can organize a school wide information technology teaching skills competition to encourage teachers to use their existing information technology knowledge in teaching design, in order to create information technology professional demonstration courses, improve teachers' teaching skills, and create a good information technology education and teaching environment; On the other hand, the salaries of excellent teachers and administrative staff who utilize information technology to integrate teaching resources can be increased, and they can be used as evaluation indicators for professional titles, achieving a perfect integration of information technology and educational management work.

5.3 Improve the Information Equipment Management Platform and Promote the Scientific Integration of Information Resources

Improving the management equipment platform and building an information resource library are fundamental to enhancing the information literacy of university teachers. On the one hand, we need to do a good job in the informationization construction of the

information management platform, including the establishment of the school's hardware service platform and the construction of network infrastructure. Schools should continuously update advanced network equipment, optimize network broadband speed, purchase modern teaching equipment, build smart classrooms and laboratories, and ensure the optimization of campus hardware facilities. On the other hand, schools should actively build open and shared cloud platforms and databases to support the interconnection of resources both inside and outside the school. At the same time, teachers are encouraged to use cutting-edge information technology knowledge and skills for teaching design, build high-quality information-based teaching resource libraries, develop information-based school-based professional courses, and achieve the integration of information technology and curriculum resources.

6 Conclusion

With the rapid development of artificial intelligence technology, the education work in Chinese universities is also constantly reforming. Improving teachers' information literacy and information technology application ability is an important issue in the current development of universities. This article reviews the current status and challenges faced by the development of information literacy among university teachers both domestically and internationally. It proposes the establishment of sound information technology system standards and the strengthening of teachers' awareness of information literacy; Strengthen teachers' information learning ability and establish an information technology evaluation mechanism; Improving the information equipment management platform, promoting the scientific integration of information resources, and implementing three measures indicate the path for improving the information literacy level of university teachers.

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