



Research on the Improvement of Information Technology Teaching Ability and Cultivation of Digital Literacy of Normal University Students under the Perspective of "Digital Education"

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Abstract. The scientific and technological revolution promotes the rapid development of digital technology, and digital resources are an important factor of production. Digital ability and literacy are an important basis for promoting the redevelopment of digital economy. Education is an important means to cultivate digital ability and literacy. Digital education is also the future development direction of education. We use digital resources to achieve educational equity and improve the quality of education. As the pre-service training of teachers, their digital literacy cultivation and information teaching ability profoundly affect the digital development of education. They investigate and analyze the current situation of digital literacy cultivation and information teaching ability of normal university students in local universities in western China. This paper clarifies the training responsibilities of the government, schools and society, finds the focus of digital education cultivation, and puts forward the countermeasures of the improvement of digital literacy cultivation and information teaching ability of normal university students.

Keywords: digital education; digital literacy of normal university students; information teaching ability of normal university students

1 Introduction

Digital literacy reflects a comprehensive quality, including the practical skills of "search, processing and storage", the comprehensive use of "creating and displaying" and "problem solving and taking action", and dealing with new problems and crises in the digital age through "communication and cooperation", "protection and security" and "analysis and reflection".[1] The goal of the digital literacy cultivation of normal university students is to integrate them into the digital social environment and promote the digitalization of general education. Under the "digital education", students need to have six abilities: 1. We master the digital education information search and filtering skills,

are able to evaluate and identify the obtained digital education information according to certain standards, and finally extract the information that meets the needs for preservation. 2. Based on the understanding and compliance of social communication rules, we actively participate in the sharing and cooperation of digital education information, and influence each other. 3. Under the legal standards, we carry out the development and innovation of digital education information, and process and integrate it combined with their own professional advantages. 4. In the communication of digital education information, we pay attention to ensure the safety of oneself and others, do not disclose private information, and do not use unhealthy information. 5. According to the actual situation of study and work, we clarify their own needs, consciously seek solutions, rely on technology and tools to meet the needs, and solve problem. 6. We conduct post-hoc analysis and reflection to deepen the understanding of digital education.[2]

The digital literacy of normal university students is projected into the teaching work, and it is presented with strong information teaching ability. We effectively use information resources to carry out teaching activities so as to complete the teaching tasks. According to the information teaching ability of normal university students, it can be summarized as: ability consciousness, technical skills, design ability, application ability and ethical responsibility. This complements the six major digital literacy abilities of normal university students.

2 Research and analysis of digital literacy and information teaching Ability of normal university students

Through literature sorting, the questionnaire on the cultivation of digital literacy of normal university students was compiled with reference to the Information Teaching Ability Standard for Normal University Students and the Digital Literacy Framework for German Teenagers. A total of 150 normal university students from western local normal universities were selected as research samples, and online research was carried out using questionnaire stars, and 131 valid questionnaires were collected. Combined with the research data and research results, some professional teachers and normal university students were interviewed to further understand the status quo of digital literacy and information teaching ability cultivation of normal university students.

2.1 Lack of learning time and autonomy

According to statistical analysis, it shows that more than 50% of the students on average using digital media to learn less than 3 hours a day, and according to the China youth network campus news agency in 2019 around the phone Internet topic of 1220 college students questionnaire survey results show: More than 40% of students spend more than 5 hours online every day, and more than 80% of students use the Internet mainly for social chat. With the promotion of 5G and the construction of digital campus in the past two years, it is more convenient for college students to get online. Online classroom, online shopping, game entertainment, online social networking and video watching,

have become an important part of their daily life[3], and their online time is also increasing. Compared with the total network time, the learning time is too short. In addition, 61.19% of students use digital media for the primary purpose is to complete homework. The primary purpose of pre-class preview is relatively small, accounting for less than 10%. Independent time of college students is very abundant. Homework is a part of the study, but with the reform of teaching mode, Pre-class, in-class and after-class learning has become an important form of contemporary college students, especially self-study has become an important link of teaching, and is also an important link of cultivating normal information literacy. Practical skills in "search, processing and storage" will be improved.

2.2 Insufficient attention to ability and heavy social entertainment

According to the statistical analysis, only 6.72% of the students first consider improving their information teaching ability when using the data media, and the overall attention is low. Putting social needs and entertainment first account for 21.64%. The two options are more attractive to students. In the top ranking position, the average comprehensive score is 3.43 and 2.63 (average comprehensive score = $(\sum \text{frequency} \times \text{weight}) / \text{persons filled in this question}$). By the visit, we found that there are many college students addicted to online games. With their mobile phones in life and even in class, online games affect their concentration and distract them from their studies.

2.3 Information retrieval methods are diversified, and search engines rely too dependently

The practical skill in digital literacy and the technical skill in information teaching are to master the digital information search and filtering skills, be able to evaluate and identify according to laws and regulations, and finally extracting the information that meets the needs for preservation. The survey found that college students have mastered a variety of retrieval tools and can obtain digital resources through multiple channels and various ways. But authoritative professional digital resource databases and retrieval tools do not absolutely dominate. When retrieving information, Baidu, 360 and other browsers become the primary channels, accounting for as much as 93.28%, and the use of CNKI, VIP journals, school libraries, MOOC, Wisdom tree and other professional teaching resource libraries are not high frequently. In the era of information explosion, open commercial search engines can obtain a large amount of fragmented information, but the systematic, authoritative, professional and security of information are inevitably disturbed by economic interests, which is not conducive to students to master authoritative and systematic information resources and subsequent development and innovation.

2.4 Poor training effect of digital literacy and information teaching ability

The digital literacy and information teaching ability of normal university students are mainly cultivated through the school courses, but the comprehensive ability of the system can not be completely solved by a certain course.[4]According to the survey, more than 80 percent of the students improve their digital literacy through school course learning and personal interest self-study, which is relatively single. Students' information teaching ability mainly depends on the modern education technology, a single learning mode. Only about 30 percent of the students can master the multimedia courseware, network courseware, streaming media courseware and digital education TV teaching material design, production and teaching application. They think they have mastered the "student-oriented" information teaching. However, 71.64 percent of the students say they plan to teach in the future and will use information teaching methods in their teaching.

2.5 Non-information teaching of information teaching

More than half of the students think that the information teaching skills taught by the teacher combined with the information teaching skills used by the teacher is more conducive to their information teaching skills. However, in the actual teaching, only 29.85 percent of the students had participated in the "flipped classroom". Traditional teaching means is based on written teaching materials, static courseware teaching, with modern education technology, for example, teaching material contains a lot of information technology knowledge, abstract and boring. If the teaching method cannot be changed and the information-based teaching can not be realized by the information-based teaching means, it is difficult for normal university students to truly master the skills of information-based teaching and experience the charm of information-based teaching.. Although 57.46 percent of the students have actually participated in the design, production and teaching application of multimedia courseware, network courseware, streaming media courseware and digital education TV textbooks, they are more in the imitation stage. Their creation and innovation ability are still lacking. Students cannot conduct post-analysis, reflection and knowledge transfer. They have a simple understanding of digital education, and cannot apply the learned knowledge to new scenes. Relying on technology and tools to meet needs and seeking solutions are weak.

3 Training strategy of digital literacy and information teaching ability of normal university students

The strategic value and era connotation of digital literacy and information teaching ability of normal university students under the background of "digital education" are increasingly prominent[5]. As policy makers, industry managers and social environment educators, the government should play a good role in guiding and serving them,

improving the level of education information infrastructure construction, and the national public service system of digital education resources[6]. As education administrators and education providers, schools should play a good role in cultivating and supply, promote the education and teaching reform of deeply integrating information technology and intelligent technology, and create all kinds of digital education resources at all levels. As a participant, the society should play a good role in boosting the evaluation and build a public service system of lifelong learning experience to serve the whole people.

3.1 Optimize government guidance and services

As a provider of public services, the government's top-level design role of formulating rules and regulations profoundly affects the supply of digital education resources. Digital education resource construction and digital education environment support constitute the material hard foundation and environmental soft foundation for the development of digital education. On the basis of expanding the supply of digital education resources, the government should also consider the supporting rules and regulations to provide a standard basis for the supply side and standardize the supply of digital education resources. The government should not only consider the balanced allocation of educational resources and the effective policies at the macro level, but also mobilize all stakeholders to participate in the supply of digital education resources at the middle level, and pay attention to the supply quality of digital education resources and the interest protection of resource users.[7]

Strengthen the service awareness, to meet the diversified needs of digital resources. In the past, the government's supply of digital education resources was more one-way, with unclear service objects, lack of systematic planning, and single curriculum resources construction[8]. They did not consider the actual demand of the demand side. Influenced by regional differences, urban and rural differences, school differences, subject differences and other factors, digital education resources are inconsistent in practice, which cannot fully meet the use needs, and reduce the utilization rate and use efficiency of resources. At the same time, the real environment of the great development and prosperity of all ethnic groups in China require the diversity and ethnic characteristics of digital education resources, and schools in ethnic areas have more urgent requirements for digital education resources.[9]In the new era, the supply of digital education resources should fully combine ethnic characteristics, regional differences and subject characteristics, give full play to the advantages of digital resources, promote teaching reform, and improve the quality of education and teaching.

Break down barriers and improve the availability and operability of digital resources. Information literacy and information teaching ability both put forward the development and innovation of digital education information, the design ability and application ability of processing and integration. This inevitably involves teachers and students to digital information resources download, editing and other technical operations. In practice, the online pictures, manuscripts and other data are convenient to obtain and easy to process and perfect. However, the acquisition and processing of audio and video is relatively cumbersome, with technical requirements and limited equipment terminals,

which hinders the development and utilization of digital education resources by teachers and students, and are not conducive to the creation of digital education resources combining the advantages of various majors. When building a digital education resource platform, the government needs to consider the availability and operability of the platform resources, so as to facilitate access and reduce restrictions.

3.2 Improve school supply and cultivation

Strengthen environmental construction and the concept leads practice. Colleges and universities can cultivate students' digital literacy and information teaching ability by combining formal and informal occasions. Professional course teaching is the basis of cultivating knowledge and ability, but also the main position. The construction of information teaching environment in the school provides external support for information teaching. The renewal of the information concept of teachers and students provides the endogenous impetus for the information teaching. Colleges and universities should speed up the construction of smart campus and smart classrooms to meet the needs of information teaching equipment and places. We strengthen the improvement of teachers' information teaching awareness and ability, form a strong demonstration role for normal university students, guiding normal university students to update their educational concepts. We correctly recognize information technology, and form a digital literacy that adapts to the development situation of The Times, solves the problems of The Times, and improves the improvement of information teaching ability.

Build curriculum system and perfect training mode. The school will incorporate the cultivation of digital literacy and information teaching ability into the training objectives of all courses, highlighting every link of teaching. In the digital era, collaborative talents who deal with complex problems are more in line with the needs of social development. Education undertakes the task of cultivating and exporting talents, and we should improve the construction of curriculum system guided by the needs of The Times[10]. Digital literacy is a kind of comprehensive ability, which requires both information technology with engineering background and critical thinking. Its cultivation must be based on the coordination of multi-professional curriculum system[11]. Based on theory teaching, we follow the development direction of the job market talent demand, build around the core professional curriculum the practice teaching platform, cross-professional and cross-department teaching practice platform to provide students teaching practice, facilitate knowledge transfer and innovation, improve their information teaching ability.

We will build an information-based teaching team and promote education and teaching reform. The implementation of teacher teaching directly affects the quality of education. As the main body of education implementation, the information technology ability, information teaching ability and the ability to solve problems will penetrate into every link of teaching implementation, and have a subtle demonstration and guiding role in the cultivation of students' digital literacy and information teaching ability. The education and teaching reform break the original one-way teaching mode between teachers and students, using information resources and information-based teaching means to highlight the main position of students in learning. Based on teaching tasks

and teaching problems, flipped classroom is promoted. Students are encouraged to study theoretical knowledge before classes. Students are guided to conduct problem-oriented discussion, which guides students to cooperate and practice after class, and internalize knowledge in mind and externalize it in practice. We stimulate students' interest in learning, improve their independent learning ability, and improve digital literacy cultivation and information teaching ability through the whole learning process.

3.3 Social participation will boost educational reform

Education has been closely related to social development since its birth, and the development of educational practice activities cannot be separated from the support and participation of various social organizations. The development of 5G has triggered social changes and driven the development and reform of educational environment, educational resources and educational mode[12]. The educational reform needs a large number of resources and technical support, and the reform supply cannot be separated from the participation of enterprises, scientific research institutes and other industry organizations. The government guides the formation of an education development environment of emphasizing education, teaching assistants, and uses social forces to improve educational reform.

4 Conclusions

Digital education is the general trend of development. In the face of many problems existing in the cultivation of normal university students' digital literacy and information teaching ability, the government, society and schools need to participate in and cooperate with each other to constantly guide, optimize, improve and boost the cultivation of normal university students' digital literacy and the promotion of information teaching ability.

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