Original Paper

Training Path of Computer Application Ability and Computational Thinking of Normal University Students under the Background of Teacher Professional Certification

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Abstract

Since the implementation of teacher professional certification, it has effectively promoted the construction of hardware and software of normal major in colleges and universities, especially the construction of modern smart classroom, interactive microclassroom, online teaching case base, multimedia computer room, VR virtual laboratory, etc., which provides the basic guarantee for the improvement of information technology ability of normal students. The cultivation of computer application ability and computational thinking is the essential core quality of "four good teachers" in the information age. Through the interpretation of "certification standards", the paper analyzes the current situation of normal university students' computer application ability, and probes into how to cultivate normal university students' computer application ability and computational thinking under the background of normal professional certification.

Keywords

teacher training, College students, Certification, Computer, Information technology, Computational thinking

Under the basic teaching professional certification concept of "student-centered, output-oriented and continuous improvement", since the implementation of teacher professional certification in 2017, the quality of teacher education has been promoted and a student-centered teacher education system has been gradually formed. With the in-depth application and development of education informatization and the Internet, the graduates of normal major have a strong computer application ability and the establishment of computational thinking has become the first of various necessary teacher literacy. Most of the new college students come into contact with computer late, and their application level of common computer

skills is obviously too low, and it is difficult to adapt to the network environment and online and offline mixed learning after entering the university. Therefore, how to guide and help students master modern computer office technology, basic computer network technology, commonly used computer video and audio production technology, and necessary plane graphics and image processing technology in the course of "Basic Computer Application" and education and teaching practice, as well as daily student activities, comprehensively improve their computer application ability and establish computational thinking? It is of great significance.

1. Requirements and Objectives of the Top-level Structure of Teacher Professional Certification for Normal Students' Information Technology Literacy

5.2 [Quality and ability] in the "Implementation Measures for Normal Professional Certification of Colleges and Universities", it is clear that normal students should have strong classroom teaching, information technology application and learning guidance and other education and teaching abilities. 2.5 Technology Integration "of the" graduation requirements "of the" Secondary Education Professional Certification Standards "(Level 3) is clear: Normal university students should initially master the methods and skills of applying information technology to optimize subject classroom teaching, and have the initial experience of using information technology to support learning design and change students' learning style. From the implementation measures of teacher professional certification and related certification standards, it is not difficult to find that mastering information technology and using information technology to improve normal college students' teacher literacy, building teaching design ability and classroom teaching ability have become an important content and module of current normal college students' learning and development. This requires that in the process of normal teaching, we must take the improvement of students' information technology ability as the most basic core ability to cultivate normal college students, whether from the perspective of teacher certification or from the aspect of information technology literacy improvement, normal college students should always take teacher skills as the core quality to improve. At the same time, if normal university students want to develop sustainably, they should also master the necessary information literacy. For example, if our students want to participate in various competitions, they must create and refine their own courseware or competition video through the improvement of information literacy. No matter from the basic graduation requirements of normal college students, the requirements of teacher certification, or the follow-up development of normal college students in different stages or different development dimensions, normal college students should take information technology literacy as the core quality in the four years of college to cultivate and hone.

2. Analysis of the Current Situation of Computer Application Ability of Normal Students

Most of the current normal university students' computer application ability only stays in the basic stage of learning and application of common office software. On August 28, 2023, China Internet Network

Information Center (CNNIC) the 52nd "China Internet Development Statistics Report" shows that: as of June 2023, the number of Internet users in China has reached 1.079 billion, and the Internet penetration rate has reached 76.4%. Students account for about 20% of the total Internet users, a relatively high proportion. From this data, it is not difficult to see that students have become a large group of Internet users. They have been highly accustomed to learning through the Internet and expressing their thoughts and opinions through the Internet. More importantly, college students have fully adapted to online teaching after the COVID-19 epidemic has been normalized, and their online learning time has increased significantly compared with before the epidemic. As normal university students, if they do not have a strong computer and network application ability at the beginning of college, it is difficult to adapt to the subsequent professional courses. However, the core of the basic computer course that normal university students learn can include the three major office software, namely Word, Excel and PoerPoint. The computer knowledge or ability of this module is far from adapting to the mixed teaching mode of offline and online.

2.2 Normal University Students' Strong Computer Application Ability Is the Basis for Improving Their Normal Literacy and Learning Other Courses

Computer has become an important basis and tool for learning. Only after college students have mastered a certain degree of computer application ability can they better adapt to the subsequent study of other university courses. At present, according to the requirements of teacher certification and normal college student training goals, especially the education information 2.0 action plan requires "to accelerate the modernization of education and the construction of education power, promote the development of education information in the new era, cultivate new engines of innovation-driven development, and train innovative talents in combination with the national Internet +, big data, a new generation of artificial intelligence and other major strategic tasks." It is imminent to focus on cultivating the computer application ability of normal students. In the teaching practice of "Computer Application Basis", it plays an important role in cultivating college students' computer application ability, innovation ability and calculation thinking, promoting college students to master the commonly used calculation skills and comprehensively improving the information literacy of normal college students.

2.3 At Present, Normal College Students Are Highly Dependent on the Internet and Computers for Autonomous and Fragmented Learning, but the Computer Skills They Should Master Are not Perfect

After the epidemic, as the era of rapid development of knowledge economy and information economy, the network has become an indispensable part of college students' study, life and work, especially in the learning link, the use of the network for active learning and independent learning has become the mainstream. At the same time, students can quickly realize online learning and fragmented learning in any place through modern electronic devices such as mobile phones, tablets, laptops and so on. And some free or low-cost high-quality online courses also have a great impact on students, many students can almost in the case of no or very little pay, according to their interest in knowledge, to choose some of the famous online courses for independent learning. It can be said that in the era of big data, knowledge has

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no boundaries, and learning has become the norm. As students, they need to continue to learn. As college teachers, they also need to constantly update and learn more systematic and comprehensive information technology knowledge, and master the methods and methods of network teaching flexibly. When our normal university students do not master the corresponding computer hardware and software skills, it is difficult to adapt to the current learning mode.

3. The Current Situation of Information Technology Training Hardware Construction in College Normal Majors

Take Z university as an example. In recent years, in order to improve the training quality of normal majors, the university has invested a lot of money to build the hardware conditions required for running various normal majors. At present, it has built and put into use 14 smart classrooms with cloud transmission and other functions, 11 professional lecture training microclassrooms for students, 3 powder writing training rooms for video playback (a total of 150 practice positions), and 15 computer rooms (a total of more than 1000 seats) for all kinds of routine software practice and learning. At the same time, online databases such as Future School, Super Star Online Course and School Online have been built, covering excellent teaching cases or video resources of nearly 800 courses.

From the above hardware construction, it is not difficult to see that the current general colleges and universities have already possessed the basic hardware and software foundation for training and improving normal literacy. However, through the author's investigation of Zefficient, it is found that there is a similar phenomenon in this university and other universities, that is, many teacher skills training rooms are only used when courses are set up, and the utilization rate is very low.

4. Explore the Cultivation Path of Normal University Students' Computer Application Ability and Computational Thinking

4.1 Through the Reform of the Outline, Teaching, Practice, Assessment and Other Links of "Computer Application Basis", We Should Focus on Cultivating Computer Practical Skills and Establishing Computational Thinking in Normal Schools

At present, all colleges and universities set up courses of "Fundamentals of Computer Application" in their freshman year. Although the name of the course offered by each school is different, the main content still focuses on the introduction of basic computer knowledge and the training of skills in the use of common office software, including: computer development and overview, Windows operating system, Word word processing, Excel spreadsheet, PoerPoint production, network foundation and other six modules. However, with the rapid development of network information technology, especially the popularization of online and offline mixed teaching mode during the epidemic period, as well as the in-depth application and integration of modern live broadcasting technology and Internet technology, students only master ordinary basic computer skills, and it is difficult to adapt to the teacher's requirements of interactive teaching. Therefore, in the freshman year, it is necessary to strengthen the

top-level design to carry out reform. At the same time, teachers of computer courses should fully enable students to become the master of learning through flipped classroom, so that they can strengthen the training of skills in practice, especially the practical ability of computers, such as mastering the most basic word typesetting, the data processing of spreadsheets, and the design and production of PPT. On this basis, it is necessary to boldly increase the processing of graphics and images, the use of the network, video and audio editing, programming and computational thinking and other modules. In the practice process of college students' actual learning, a large number of students are required to self-cultivate and exercise computer skills in their spare time, such as the typesetting of papers, the design of PPT for various activities, the design of background and the editing of video and audio activities, as well as the design and processing of some simple small programs that use computers to solve problems in daily life. All of these can improve college students' computer hands-on ability and establish computational thinking to a certain extent. In the assessment of the course of computer, the focus is to examine the daily teaching process, students in the practice of some achievements or participate in some computer skills competition, rather than focusing on the final exam.

4.2 Focus on Cultivating Students' Information Technology Processing Ability Through Computer Practical Activities

Looking at the various kinds of competitions carried out by normal colleges at present, the main competition is the teacher skills competition, of course, it also includes courseware making and PPT design and production, text entry competition, layout design, resume design teaching plan design and so on. In order to improve the computer application ability of college students, as a grass-roots department, first of all, we should strengthen the design of computer practical skills from the top-level system. For example, various competitions such as Network Culture Festival, computer operation skills contest, program design contest, courseware making contest, PPT design and production contest, resume making contest, paper typesetting contest, advanced data processing contest, Internet competition can be used to guide and help students consciously cultivate and improve computer skills in practice. When each college has the support of the system and activities as the carrier, college students will take the initiative to step off the Internet, put down their mobile phones, and participate in various activities, so as to exercise and improve their ability through participating in activities, especially as normal college students, they can master computer skills and improve their information technology ability in daily activities or competitions.

4.3 Taking the Improvement of Normal Literacy as the Core, the Second Tutorial System Is Introduced to Strengthen the Training of Normal University Students' Computer Application Ability in Practice

As we all know, the improvement of normal university students' teacher literacy and skills should not only stay in the classroom, but also need a lot of training and polishing in daily study and life to improve college students' teacher literacy. Through the introduction of the second tutorial system, the focus is to pay attention to how students improve their own literacy in the 4 years of college life through the guidance and supervision of teachers. The operation of this mode can reflect the advantages of the

training mode of master's apprentices, and at the same time allow an ordinary college student to get special guidance from a teacher in the study and life of the university, especially in the improvement of normal literacy. The tutor can let the students under his guidance participate in the courses taught by the teacher, and know how the teacher prepares for and attends classes. In particular, it is necessary to let students fully understand how the teachers in the university obtain some teaching resources or materials through the current information technology, so as to organize and make them into courseware or beautiful PPT, and finally show them in front of the students for teaching. For example, if the normal university student has poor language ability, the teacher can give accurate guidance and arrange him to participate in corresponding activities, or listen to corresponding courses more, or conduct online consultation to improve and make up for his shortcomings. When students participate in various activities or social practices, our instructors can ask them to boldly use modern computer technology, network communication technology, multimedia technology, or current we-media means to improve their information literacy or computer hands-on ability.

4.4 Actively Open the Teacher Skills Training Room, Promote the Computer Application Ability of college Students through the Incentive Mechanism, and Strengthen the Self-awareness of Students to Strengthen the Teacher Skills Training

"Master leads the door, practice in the individual", in the teaching system of the university, what we advocate now is to take students as the main body, the direction of education reform is to flip the classroom, so that students become the center of learning. In order to improve the computer skills and information technology level of college students and teacher literacy, the grass-roots departments can open skills training rooms free of charge, such as public computer rooms, three pen characters training rooms, microclassrooms and so on. When our students use the card, it will form the corresponding big data, in the selection of three good students, outstanding student cadres or some other awards, especially in the development of party members or determine the party activists, you can use these data as an evaluation factor. Because this can not only improve their teacher skills and information technology level, but also can improve the conduct score, improve their comprehensive GPA. Such strengthening mechanism and incentive mechanism will invisibly motivate our students to take the initiative to strengthen the training of normal skills and the improvement of computer skills.

About the author

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