

Influence Factors and Prediction of ICT Application Ability in Post-Epidemic Era in China

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Abstract

In the spring of 2020, the new coronavirus pneumonia epidemic struck, and the development process of many industries was pressed the pause button, but the shortcut button was pressed for informatization education. The nationwide delay in the start of school, and the ensuing large-scale, high-frequency as well as all-round online teaching, all posed challenges and opportunities for teachers. In this context, based on the current situation of teachers' information technology application ability in the post-epidemic era, this study attempts to explore the impact of online teaching on teachers' information technology application ability during the epidemic. At the same time, it looks for the factors of problem exploration, and proposes strategies to help teachers improve the ability of information technology application, aiming to provide some basis and reference for schools and teachers to meet the improvement of information technology application ability in the post-epidemic era.

Keywords: information technology application ability, post-epidemic era, online teaching, learning effectiveness

1. Research Background and Significance

COVID-19 swept the world in early 2020, affecting several countries and regions, and nearly 90% of educational institutions worldwide were forced to close their doors. This poses a huge teaching challenge to more than 63 million teachers around the world, when the epidemic affects the normal school learning of more than 1.543 billion students. In response to the new crown pneumonia epidemic, China has actively responded to the call to suspend classes and non-stop schools. In a short period of time, all teachers, schools and education companies rushed to the front line of online teaching. This is an examination for China's educational informatization construction. This big test has pushed modern educational technology and informatization education to the front line (Chen Youguang, 2020). In the era of rapid development of artificial intelligence, big data and 5G, it has had an immeasurable impact on the field of education technology. Educational informatization software has sprung up during the epidemic. For example, teaching platforms such as Chaoxing APP, QQ Live, Voov Meeting and Ding Talk have been applied and developed unprecedentedly. Large-scale and high-frequency online teaching has brought major challenges to front-line teachers' information technology teaching ability. The practical application of the pattern is far from enough. The sudden new crown epidemic has opened the curtain of online teaching in schools in my country. The integration of online and offline teaching will be the new normal of the education model. Information-based teaching is the main means of implementing online and offline teaching. The key to education lies in teachers (Liu Lin & Gao Chunyan, 2020). The reform of the educational model will inevitably put forward different requirements for teachers.

2. Analysis of the Problems and Influencing Factors of Teachers' ICT Application Ability

2.1 Technical Literacy

A survey found that most teachers are able to carry out simple information technology operations and have the willingness to actively obtain information. At the same time, teachers can also use search engines (such as Baidu

Library) to download and use educational resources according to their teaching needs, and can skillfully use daily tools for basic processing of materials. But most teachers are not proficient or proficient when it comes to information literacy. Around this problem, there may be the following three influencing factors: First, teachers' understanding of information technology stays at the level of information equipment operation, and they have insufficient understanding of information technology concepts. The second point is that teachers have low self-efficacy. Most teachers regard information technology training as a task that needs to be completed in their work (Ye Hui, 2020). Although most teachers recognize that information technology can help improve classroom teaching efficiency, due to heavy teaching tasks, high test pressure, and unskilled information technology operations, the increase teachers are burdened with work, so most teachers are passive when receiving information technology training activities. Third, teachers lack relevant platforms and resource libraries that can be used, and the number of resources provided is small, resulting in low effective utilization and difficulty in finding suitable teaching resources within a certain period of time.

2.2 Planning and Preparation

At present, online teaching as a whole presents a situation of insufficient preparation for information-based teaching, and the ability to develop digital educational resources needs to be improved urgently. Most teachers are at an average level in terms of preparation for information technology. First of all, teachers cannot design an information-based teaching model to achieve teaching goals. The design of information-based teaching is only based on the use of media technology, and some theories of information technology are loaded into the impact of teaching models and learning methods. Secondly, some teachers often fail to make full use of information technology to organize students' innovation and cooperation ability (Jia Wenjun, Guo Yuting & Zhao Zening, 2020). Finally, teachers cannot choose appropriate online software to help students learn knowledge, lack of application of knowledge construction tools and promotion to students. Around this problem, there may be the following three influencing factors: First, the lack of informatization systems and policies has led to the dispensation of informatization teaching in teaching work. Second, there is a lack of systematic training activities, and teachers lack systematic knowledge, understanding and application of information-based teaching design and implementation. The third is the lack of information literacy environment. Teachers basically use search engines to find digital resources in the course of preparing lessons. They will simply modify the searched materials in combination with their own courses to meet the needs of the class. All in all, whether in terms of the large teaching environment or the practicality of software equipment, there has not yet been created an environment suitable for the improvement of teachers' information literacy.

2.3 Organization and Management

At present, most teachers cannot effectively help students obtain equal opportunities to use hardware equipment, and teachers also lack effective processing of students' feedback and the integration of information technology concepts and subject teaching in the teaching process is weak. Around this problem, there may be the following three influencing factors: First, the traditional teaching concept is deeply rooted, and the acceptance of design information teaching is not high. The second is the lack of corresponding policies and systems, and the lack of external pressure and requirements, and the requirements of schools and teachers for their own informatization will be reduced accordingly. The level of organizational and management dimensions is correspondingly low. Third, the school's hardware equipment is not complete. There is only one recording room and computer room in the primary school. The classroom is not equipped with an electronic whiteboard, which lacks interactivity and reduces students' access to information resources. Fourth, there is a lack of special training activities and teachers' organizational and management capabilities should be specially strengthened.

2.4 Assessment and Diagnosis

Some studies have shown that even if the online teaching platform of the epidemic provides analysis functions, teachers ignore its use. Teachers use traditional methods in assessing and diagnosing. It can be seen that teachers' evaluation of students is far from being based on scientific data analysis, especially in the establishment of electronic files. The overall level of teachers in this school is relatively low. Around this problem, there may be the following influencing factors: First, due to the limitation of consciousness, teachers have insufficient awareness of using information technology to carry out teaching evaluation activities. The performance is that teachers focus on using information technology to carry out classroom teaching activities, and still use traditional teaching evaluation methods for teaching evaluation activities. Second, teachers are less interested in teaching evaluation software than subject software and teaching software, and teaching evaluation software is relatively unfamiliar to teachers. In addition, teaching data analysis software such as analyzing students' learning data is relatively difficult, and teachers are prone to fear.

2.5 Learning and Development

Teachers are willing to use network platforms and resources to enrich and improve their information technology

capabilities, and recognize that information technology plays an important role in promoting teachers' professional development and classroom efficiency, but their schools rarely hold corresponding training activities. Around this problem, there may be the following influencing factors: First, schools' leaders did not pay enough attention to the development of teachers' informatization nor did they encourage teachers to apply it to the teaching of specific subjects. Second, the training of information technology application ability is insufficient and lack of targeted training. Even if there are online training resources, there is a lack of analysis of the trainee teachers' learning situation, targeted training cannot be carried out, and information technology has not been applied to daily teaching (Sang Xinmin, 2020). The third is the lack of external requirements for the use of information technology. During the epidemic, teachers were forced to have clear goals and heavy tasks due to external requirements. In the post-epidemic era, teachers are faced with completing the work and tasks of online and offline docking. Most of information-based teaching is the spontaneous behavior of teachers. Therefore, most teachers have completely recovered in information-based teaching before the epidemic, which reduces the requirements for its own information technology capabilities.

3. Strategies for Improving Teachers' ICT Application Ability in the Post-Epidemic Era

3.1 Parallel Concepts and Skills, Rich Resources

Review the teaching mode of online teaching during the epidemic and offline teaching after the resumption of classes, summarize the similarities and differences between online and offline teaching, and lay the ideological foundation for the innovative and integrated mixed teaching mode. Focus on concept guidance and example explanation, and visualize the related theory of information technology and a new model of teaching: blended teaching model. Actively carry out practical simulations, so that teachers can master the relevant theories of information technology applications on the basis of combining theory with practice. Schools can organize teachers to conduct online and offline teaching observations, invite experts to give lectures based on typical cases of innovative integration applications, encourage teachers to communicate and share in groups, and deeply understand the innovative concepts of technology application.

During the online teaching period of the epidemic, teachers frequently operate information skills. After the epidemic, teachers should also pay attention to the basic skills of teachers, sum up experience and fill in the gaps for teachers' informatization development, so as to effectively improve teachers' informatization ability. Encourage teachers' enthusiasm, self-confidence and action in the operation of software and hardware. On the other hand, schools should develop school-based informatization teaching materials, invite professional teachers to carry out training for the development of teachers, and carry out school-based and normalized training activities. Build a local online training platform for teachers, and jointly promote the development of teachers' information skills online and offline. In terms of training content, ensure the pertinence and applicability of the content. After the training, teachers are encouraged to share and transfer learning content to ensure the quality of output. At the same time, it also improves teachers' self-efficacy, thereby improving teachers' information technology application frequency and application efficiency and ability. In addition, the construction of an information-based environment and related equipment is the basis for improving the technical literacy of teachers, just like "no rice can make a good woman's cooking". Therefore, for the improvement of teachers' technical literacy, learning should build an information resource platform, optimize teachers' experience in hardware, and enrich resource libraries in software, from material types to case study resources, and then to the use of tools for related disciplines.

3.2 Increase Support, Change Concepts

In the post-epidemic era, schools and teachers should actively change the inherent concepts of traditional teaching models and reasonably apply advanced network teaching technology to teaching activities. Teachers must get rid of the path dependence of experience-oriented professional development, and transcend the dual convenience imposed by methods and technologies on themselves and the resulting instrumentalization. Based on the relationship between education, technology and pedagogy, take the road of real excellence and assign value to your actions, so as to achieve the teaching effect of getting twice the result with half the effort.

At this stage, the residual temperature of online teaching information technology has not diminished, and the government should continue to encourage teachers to make more use of, explore and innovate the advantages and models of information technology. Governments at all levels and education authorities should change their functions to a service-oriented, focusing on comprehensive planning, policy guidance, scientific management, and proper supervision, so as to improve the executive power of local governments. In particular, the county-level government, as the main responsible department for school education, should shoulder the mission of the times, keep up with the pace of information development in the post-epidemic era, and support the reform of educational informatization application models and the in-depth integration of information technology and curriculum teaching (Yang Zhen, 2018). At the same time, the government should also encourage the multi-party collaborative participation of the government and schools, research institutes, enterprises and other social third

parties. In addition, classroom organization and management focus on using information technology to improve teaching methods, effectively implement information-based classrooms, and build an information-based teaching environment. Therefore, teachers need to design the corresponding organization and management links according to their own classroom goals. Organize and manage special training on the application of information technology in the process of classroom teaching, break traditional teaching, establish an equal and two-way interactive classroom structure, encourage students to contact and use information resources, and cultivate students' information awareness. These all need to be systematically learned through training to improve teachers' organizational and management capabilities.

3.3 Build a Learning Community

The post-epidemic era will put forward higher requirements for the design of information-based teaching, and the information explosion era will pose greater challenges to the acquisition of resources. Planning and preparation are also one of the most important competency dimensions for teachers' ability to apply information technology. Regional policies and school systems are important factors in motivating teachers to effectively implement information-based teaching. On the basis of rationally arranging teachers' work and study arrangements, systems and policies for teachers' informatization teaching design should be formulated so as to better adapt to the development of a blended teaching model in the post-epidemic era. Among them, policies and institutions are mainly driven by incentives. Using a mixed mode of online and offline teaching to carry out systematic training, training is an effective way to improve teachers' information technology capabilities, and the theory and practice are parallel measures. The training content should be systematic and comprehensive. From the popularization of theoretical knowledge, to the mastery of basic technology, to the understanding of advanced technology, it should run through the entire training content to enrich the learning content. Among them, the mixed training mode mainly includes expert lectures, excellent teaching observation, online training and other methods. After the training, teachers should prepare lessons collectively, communicate and share together, build a learning community, and complete the process of problem-teaching design-action-reflection which is a collaborative process of doing and thinking, so as to effectively improve the ability of information-based teaching. It is very necessary to provide teachers with rich resources and tool support, create rich information technology conditions, encourage teachers to try, experience, and innovate, and create an atmosphere for information technology application. Integrate information technology into the teaching classroom to achieve the goal of optimizing teaching, so that every teacher actively builds information-based teaching, and integrates information-based teaching in each classroom. Therefore, make learning information-based teaching the norm, and implement information-based teaching to permeate every teacher and every classroom to create a good information-based atmosphere.

3.4 Improve Self-Learning Ability

Self-directed and active exploration and learning is the source of motivation for teachers to improve their own information technology application ability, and the learning effect brought by it is unmatched by external training. During training, teachers are in a passive position, learning for the sake of training results, lacking attention and enthusiasm for learning. Self-directed learning is a spontaneous activity to meet one's own teaching needs. It is able to complete the teaching process independently, and is willing to invest more energy and time to learn, practice, apply and improve at the same time. Schools are the main environment for teachers' teaching practice and also the policy implementation department, and play an important role in the teaching environment. Therefore, schools must accurately grasp the relevant national and local education policies and actively implement them. Similarly, schools should also establish and improve their own informatization-related systems according to their own characteristics. Comprehensively build a software and hardware teaching environment, organize targeted and personalized training activities, and cultivate teachers' information technology application ability in an all-round way. The reform and innovation of school informatization teaching should be combined with the economy of the district and the actual education level of the school, and according to local conditions, teachers should be encouraged to actively explore and innovate the informatization teaching mode. In addition, schools and governments should give certain support and rewards to places or individuals whose information technology capabilities have improved significantly, so as to increase teachers' enthusiasm for information technology application and promote the development of their information technology capabilities.

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