Exploring the Challenges and Paths of Teachers' Information Competence Development in the Context of Online Education

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Abstract. With the prevalence of "Internet+" and the impact of the new pneumonia epidemic, online education has gradually become an important part of the education market. However, at the same time, many teachers are facing challenges such as unclear awareness of role change, low level of information literacy and insufficient online teaching skills. Therefore, teachers need to reposition their roles, update their educational concepts, participate in training activities, and improve their information literacy and online teaching skills to adapt to the development of the times.

Keywords: Online education · Teachers · Information competence · Information literacy

1 Introduction

In recent years, with the increasing development, maturity and popularity of Internet technology, we have ushered in the "Internet+" era. The emergence of "Internet+" has had a certain impact on all areas of society, and the combination of "Internet + education" has led to a new development of the traditional education industry. The "Thirteenth Five-Year Plan" issued by the Ministry of Education in 2016 proposed to include online education as one of the key development policies in the future. The market for online education has gradually expanded, and both teachers' teaching methods, teaching concepts and students' learning styles have been transformed. 2020 saw the outbreak of the new crown pneumonia epidemic, and online education as an emergency measure has gained widespread attention from teachers, students and parents.

2 Online Education and Teacher Information Competency Development

2.1 The Connotation and Characteristics of Online Education

Online education is the deep integration and development of the Internet and education, and is a new form of education that transforms the traditional education industry with

the advanced technology of the Internet. Online education must rely on the Internet to be implemented, and the Internet is not restricted by space and has the characteristics of freedom, openness, equality and individuality. Therefore, in the context of Internet+, online education also presents the following three similar characteristics.

2.1.1   The Openness and Autonomy of the Learning Mode

Traditional education needs to be conducted in a specific physical place with relatively fixed class time and class groups. Online education breaks this limitation of time and space. Students will have the possibility to receive online education as long as they have electronic products that can be connected to the Internet, such as smartphones, tablet computers or desktop computers. In the context of online education, students will have a more open learning space and can enjoy fragmented learning anytime and anywhere according to their time gaps. In addition, online education courses are colorful and students can choose suitable online courses according to their interests and learning characteristics, in which teachers play the role of instructors, fully reflecting the concept of student-centered learning. Although online courses can give full play to the subjectivity of students' learning, they require a high level of independent learning ability.

2.1.2   The Personalization and Flexibility of Teaching Forms

Each student is an independent individual, and individualization is the main presentation form of individual diversity. Teachers should not only face up to the differences of students, but also pay attention to the personalization of their own teaching forms. It is inevitable that students will be bored with the same teaching format, and the way forward for teachers is to take into account students' individuality while striving for attractive teaching methods. In the era of big data, learners' learning habits, learning process and learning effects are transparent and traceable. Online course providers and designers can provide learners with customized personalized learning programs and implement personalized teaching based on different learning characteristics of learners according to the information records of the platform. At the same time, this personalized teaching is not set in stone; it can be adjusted in stages according to learners' learning outcomes in order to better meet students' personalized development.

2.1.3   The Shareability and Richness of Educational Resources

In the era when the Internet was not developed enough, students mostly relied on teachers' lectures, books and newspapers as a way to obtain educational resources, and sometimes students could not get immediate feedback on their learning outcomes outside of class. In the context of online education, the Internet has made all educational resources available to learners, who can watch the classes of various universities and teachers on the platform. In the process, teachers can also get instant feedback from learners and improve their teaching methods. Learners can also browse the learning notes and reflections of others on the platform and answer each other's questions. This real-time communication and exchange breaks the limitation of poor resource sharing ability in the traditional education industry and helps the free dissemination of knowledge.

2.2 Connotation and Meaning of Teacher Professional Development

Teacher professional development is a continuous and dynamic process in which teachers carry out educational and teaching activities based on their professional foundations of knowledge, competence, and spiritual character with the aim of teaching students to learn, nurture, and serve [1]. Teacher professional development mainly includes the enhancement of teachers' professional knowledge, professional skills, and professional ideas in various aspects.

In today's environment where online education is prevalent, the professional competence of teachers in the traditional education structure can no longer meet the needs of education development, and the requirements for teachers' professional development are all directed to "information" and "technology". At the knowledge level, in the era of open big data, information changes rapidly, and teachers need to acquire professional knowledge in multiple fields in order to keep pace with the times; at the skill level, teachers' ability to control information technology, to learn information culture, and to accept and process information resources will affect the production process and presentation of online courses [2]; at the ideological level, teachers who are stuck in their own ways and immersed in the traditional At the ideological level, teachers who are stuck in their own ways and immersed in the traditional teaching mode cannot conform to the demands of the times and promote their own development. It is crucial for teachers to improve their information literacy and adopt the concept of lifelong learning. Therefore, the professional development of teachers in the context of online education is bound to focus on the development of teachers' information competence.

3 Challenges to Teachers' Information Competence Development in the Context of Online Education

Online education, as a new mode of knowledge dissemination and learning, has challenged the traditional education industry. However, educational activities cannot be carried out without the guidance of educators, and the professional development of teachers faces the threat of "this educational revolution is to revolutionize the life of traditional teachers" [3]. The Action Plan for the Revitalization of Teacher Education (2018–2022), issued in 2018, proposes an innovative action of "Internet + Teacher Education", which states that we should make full use of new technologies, promote the construction and application of information-based teaching service platforms for teacher education, and promote the change of teaching methods mainly characterized by autonomy, cooperation and inquiry. Especially during the epidemic where online education dominates, there is a large gap in teacher professional development for the development of teacher information competencies. We need to address the problem on the basis of clarity.

3.1 Lack of Clarity in Teachers' Awareness of Role Transition

In the traditional education model, the classroom lecture system is the main form of teaching organization. Teachers usually transfer knowledge to students in a fixed classroom. In the context of online education, traditional education has been transformed,

and this has impacted and challenged the identity of the teacher community. Teachers will no longer be the sole transmitters of knowledge, but will be more specialized and diverse in their roles.

Most online education courses are presented to students as either recorded or live courses, and these two formats require different roles for teachers. For pre-recorded courses, students watch the video to learn the knowledge points, and the teacher arranges different teaching activities in response to the questions asked by the students. The teacher's focus changes from how to research the content well to how to answer questions for the students. The teacher's role is changing to that of a companion, a guide, and a tutor for individual students. For live online courses, it is difficult for the teacher to grasp the real situation of students listening to the lecture across the electronic screen. In such courses, teachers need to play the role of organizer of classroom communication and fully mobilize students' learning initiative and motivation through verbal encouragement and video motivation.

The above two types of online courses require teachers to play a role that many teachers are not clear enough. In addition, some teachers have forgotten that they are learners. Teachers' professional development cannot be separated from lifelong learning. If teachers consistently treat students with their previous teaching mindset and teaching style, it is not conducive to students' healthy physical and mental development, and it is not conducive to their long-term foothold in the education field. Teachers can only keep up with the times by constantly learning knowledge and updating their concepts.

3.2   Low Level of Information Literacy Among Teachers

The concept of information literacy was first introduced in 1974 by Paul Zeckos, president of the American Information Industry Association, who believed that "information literacy is the skill of using a large number of information tools and major information sources to get answers to questions". With the progress of society, the connotation of information literacy has been enriched and developed. Especially in the age of the Internet, the prevalence of online education has also raised higher requirements for teachers' information literacy level. The urgent need for teachers to improve their information literacy level comes from the needs of the times on the one hand and the students on the other.

Most students today are born in an environment where they have free access to the Internet and cell phones, and their curiosity drives them to explore digital devices endlessly, to try new things, and to be open to new information. Many of these teachers were born in a context where digital technology was not so active, and they have witnessed the change from a "world without Internet or cell phones" to a "world with Internet and cell phones". --They are new residents compared to the original inhabitants of the digital world - the students. The traditional education received by the new residents did not pay much attention to the cultivation of information literacy, which is unable to meet the needs of the natives. Therefore, in the context of online education, teachers who are digital immigrants need to improve their information literacy more than their students. Once teachers of digital immigrants have sufficient information literacy, they can surpass their students in terms of analyzing and processing data in depth, examining

and understanding others' ideas, and obtaining multidimensional views, and become educational wise people in the digital age [4].

3.3   Inadequate Online Teaching Skills of Teachers

Online education has overturned the traditional classroom teaching model, and the original teaching principles, methods and laws, the design, organization, implementation and evaluation of teaching activities may no longer be applicable to the new context. These new issues and requirements are challenging teachers' online teaching ability and testing their courage to meet the challenges. In the current situation, teachers' online teaching ability needs to be improved in these three aspects.

3.3.1   The Ability to Select, Analyze and Reconstruct the Knowledge Points of the Courses Taught

Online courses such as catechism are mostly composed of small independent and connected knowledge points that are connected to each other, thus forming a relevant knowledge system and forming the core content of the course. Each small knowledge point is presented to learners in a short and concise micro-video, which requires teachers to be able to grasp the content and difficulty of each knowledge point and explain and explain it precisely in the course.

3.3.2   The Ability to Design and Produce Micro-videos

Micro-video is the teacher's ability to simulate a real class in a situation without students, thus recording a form of course presentation that meets the learners' cognition and teaching effectiveness. Unlike the traditional classroom, micro-video is a course resource that can be repeatedly studied by learners, and the content, expression, visibility, novelty, and appropriateness of micro-video directly affect students' choice and adherence to the course, and influence the behavior and effect of learning [5]. Therefore, it is crucial for teachers to design and produce micro-videos carefully.

3.3.3   The Ability to Organize and Coordinate During or After the Course

In a live course, the communication between teachers and students is far less convenient than in the classroom, and students are often more likely to be distracted and do other things, which requires teachers to reasonably control the pace of the online classroom, actively and effectively interact with students, fully mobilize students' interest in learning, and guide the deepening of communication and discussion between teachers and students. In the video course, the teacher mainly relies on the communication platform of the learning platform to answer questions and solve problems about students' knowledge mastery, which is mostly open and transparent. Teachers need to coordinate and organize the interaction among students from all over the world with different learning levels. How to solve the doubts in a targeted and personalized way and guide students to share their experiences and learn cooperatively in a reasonable and orderly way on the platform is one of the necessary online teaching skills for teachers.

4   Online Education Spawns New Paths for Teacher Professional Development

Teachers cannot be passive or stagnant when faced with new educational technologies and the complexities of online information. Although online education brings challenges to teachers, it is also a great opportunity for teachers to promote their information competence development. Teachers need to clarify their roles and position themselves in multiple ways to improve their information literacy and online teaching skills to achieve sustainable professional development of teachers in the context of online education.

4.1   Teachers Reposition Their Roles and Update Their Educational Concepts

Online education requires teachers to be able to play the role of a companion, a guide and a tutor for individual students, and a correct educational concept is the basis for teachers to change their educational behavior. In order for teachers to better reposition their roles, they need to focus on learning and updating their awareness of online learning, self-directed learning and lifelong learning.

First, the powerful Internet can present quality courses from around the world to learners, and teachers should use the Internet platform to actively learn Internet technologies from the best people in the field, develop the habit of online learning, and be a member of the online learning system. Second, teacher professional development is a very self-driven affair, and it needs to come from the initiative of teachers. The stronger the teachers' awareness of self-development, the greater their sense of responsibility for their own development, and the more consciously they participate in self-development and self-improvement, so that their professional development can present a stronger initiative and conscientiousness [6]. Finally, it is not enough for a teacher's professional development to focus only on the present moment; a good teacher should be good at integrating professional development under the three temporal latitudes of past, present, and future, clarifying his or her professional development direction, and achieving lifelong learning.

4.2   Participating in Training Activities to Improve Teachers' Information Literacy and Online Teaching Skills

A teacher is a learner, and participation in training activities is one of the most direct and effective ways to improve teachers' information literacy. Teacher's information literacy training can exert continuous, long-term, and in-depth influence on teachers through a cross combination of on-campus and off-campus training, online and offline training, and long-term and short-term training. Teachers' information literacy training includes both theoretical knowledge and application ability. Theoretical knowledge is the premise and foundation for improving teachers' information literacy, and application ability is an important criterion for judging teachers' information literacy level.

Combining with the background of the situation, it is not difficult to find that we should focus on improving teachers' information technology application ability, especially the application of office software and network tools, the production of micro-video

slides, and online teaching on the Internet. Only when teachers can skillfully use educational resources intelligent retrieval tools, visual display tools for teaching across time and space, and teaching evaluation tools in the information technology environment [7], teachers can do a number of tasks such as online instruction, teacher-student interaction, homework review, learning analysis, and question and answer tutoring with ease. At the same time, targeted training for teachers is also essential, as each teacher has a very different teaching style, and effective training of teachers' ability to use new technologies to carry out personalized teaching will also help to enhance the attractiveness of teachers' online courses.

5   Conclusion

As a new mode of knowledge dissemination and learning, online education has created many challenges to the traditional education industry. For the teacher community, sticking to the traditional teaching identity will no longer be conducive to their long-term development. Online education is a threat but also an opportunity, which gives rise to new paths for teachers' professional development and points to new directions for their future information competence development.

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