Research on the Path of Teacher Professional Development in the Context of Smart Education

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Abstract

Smart education is a new educational development model resulting from the high integration of information technology and educational development, which brings infinite vitality to educational reform. The article analyzes the challenges faced by teacher professional development in the context of smart education, and explores the effective path of teacher professional development from the perspectives of society, school and teachers. Teachers must change their teaching thinking and establish the concept of lifelong learning, so as to meet the challenges brought by the times.

Keywords

Smart Education, Teacher Professional Development, Lifelong Learning

1. Introduction

Smart education is a new education model derived from the development and application of emerging information technologies such as big data and cloud computing in the field of education in recent years. Smart education should show the characteristics of "wisdom", not its own or who gives it. Only by participating in the reform of smart education, can teachers provide students with high-quality learning experience, thus promoting the development of education to a higher level.

From the perspective of pedagogy, teacher professional development is mainly concerned with the process of individual teachers' gradual development from novice teachers to expert teachers. Smart education breaks through the inherent education mode and allows teachers to have a broader development prospect. High-quality learning courses, rich educational resources, diversified information technology teaching tools, and diverse communication and learning plat-

forms can enable teachers to make continuous progress in teaching. But teachers are also faced with great challenges. Teachers must actively improve themselves, change teaching concepts, teaching thinking, teaching models, etc., so as to meet the challenges brought by the times, or they will be abandoned by the times. Therefore, it is necessary to analyze the challenges that smart education brings to teacher professional development, so as to explore effective ways for teacher professional development.

2. Smart Education and Teacher Professional Development

2.1. Connotation of Teacher Professional Development

With the development of the times, the connotation of teacher professional development is also changing. Scholar Clark and others summarized several changes in the research of teacher professional development in the past two decades, including changes in training, changes in adaptation, changes in self-development, changes in teaching, changes in learning, etc. (Clark & Hollingsworth, 2002). It can be seen from this that the research on teacher professional development has shifted from focusing on the growth of single knowledge and skills to focusing on teachers' lifelong learning and comprehensive development, and has clarified the main position of teachers in their professional development.

Many researchers also pointed out that teacher professional development is a process in which teachers act as learners (in schools, especially in classroom teaching) and main participants (in teacher professional development) in different social fields. In Bourdieu's view, the field is a network or a configuration with some objective relationship between various positions. The society is divided into several different fields. The members of these different fields compete to achieve their own goals (Pierre, 1998). As a member of the education field, teachers should first take their own professional development as the goal, and adapt to the requirements and challenges of the information age. Therefore, teachers should change their traditional roles in a fixed place and at a fixed time, as well as the traditional path and way of teacher professional development, so as to better meet the opportunities and challenges faced by teachers in the context of smart education.

2.2. Internal Relationship between Smart Education and Teacher Professional Development

In the process of changing the perspective of teacher professional development, teacher professional development has shifted from focusing on the learning of teachers' knowledge and skills to focusing on the enrichment of teachers' inner spiritual world. In the information age, it is far from enough for teachers to stay at the traditional level of development. The progress of information technology requires teachers to develop more all-round and diversified, and also endows teachers with richer connotation of professional development.

Professor Zhu believes that when smart education becomes the main theme of the development of education informatization, it can help build a new education evaluation system and even create a new education environment as a new education concept and method (Zhu & He, 2012). Therefore, the focus of current teacher professional development is to provide teachers with an environment suitable for future education, so that teacher professional development bears the heavy responsibility of cultivating intelligent teachers. Other scholars believe that smart education is a new education development model resulting from the high integration of information technology and education development, aiming to comprehensively use various information technologies to improve the intelligent level of the education system, so as to cultivate a large number of intelligent talents with information skills, innovative awareness and innovative ability (Tang et al., 2015).

It is not difficult to see that the reform and development of education needs to rely on the broad platform of intelligent education and cultivate innovative talents. From the perspective of teacher professional development, the most important thing is to strengthen the internal relationship between intelligent education and teacher professional development, so that teachers can become intelligent talents in the process of professional development. Only in this way can we lead those "digital natives" who have grown up with digital technologies such as internet and mobile phones in education and teaching to become intelligent learners with both innovative spirit and practical ability. In the context of smart education, teacher professional development must have new connotation and requirements, that is, teachers should not only have basic professional quality, professional knowledge and professional emotion, but also improve their own information literacy and skills, improve their professional literacy and learning ability, make full use of the Internet and big data platform in the information age, and practice the concept of lifelong learning.

3. Challenges of Teacher Professional Development in the Context of Smart Education

In the research on teachers' use of smart classrooms for teaching practice, some scholars found that "43.3% of teachers cannot effectively use smart classrooms, and many students also said that teachers' teaching mode in smart classrooms is the same as that in traditional classrooms, with no significant change…" (Mao et al., 2018) All kinds of colleges and universities that carry out smart education practice are generally facing the dilemma that teachers' ability to use smart learning environment to guide and promote students' learning is slightly weak. Teachers' teaching wisdom, teaching function, teaching focus and information literacy are facing a series of challenges and changes.

3.1. Teaching Wisdom Faces Challenges

With the rise of smart education, technology has been applied more and more in smart education. Teachers may lose their rational thinking, fall into technology

worship, and regard technology-assisted teaching as the dominant teaching. The blind worship of technology will seriously imprison or even kill the teaching wisdom and teaching style of teachers, resulting in teachers being unable to pursue the improvement of their own teaching wisdom and teaching ability when facing the dilemma of inefficient or ineffective teaching, and stubbornly seeking breakthroughs from various technologies. In education and teaching, teachers and technology should be the relationship between subject and object. Teachers should return to rationality, have research and achievements in technology application, and actively control technology to serve education and teaching.

3.2. Teaching Function Faces Changes

In traditional classroom, teachers teach knowledge and students accept knowledge. In the smart classroom, both teachers' teaching and students' learning will get more methods and resources. The authority of teachers as "knowledge owners" is gradually weakened, and classroom teaching is no longer the only way to impart knowledge. Teachers must study deeply, what to teach in the perspective of smart education? How to optimize teaching? How to achieve teaching objectives? Therefore, the main functions of teachers will gradually shift from traditional teaching to guidance, research and innovation. Teachers should use more wisdom, show more personality and adopt more flexible, intelligent and rich teaching modes in teaching practice.

3.3. Information Literacy Needs to Be Improved

On the one hand, teachers should learn to use various information technology tools, including inquiry teaching tools, expression and display tools, information retrieval tools, communication and reflection tools, teaching evaluation tools, resource management tools, teaching monitoring tools, etc. The use of these tools will further promote teachers to improve themselves. On the other hand, the components of teacher professional quality are more diverse. The ability of evaluation of information teaching, the ability of integrating disciplines and information technology, the ability of information cooperation and communication, and the ability of promoting students' personalized development will become the core competence of teachers in the perspective of intelligent education.

3.4. Teaching Focus Needs to Be Deepened

For a long time, education has emphasized on taking students as the main body and guiding students to develop independently by teaching students in accordance with their aptitude. The rise of intelligent education has provided unprecedented convenience for achieving "teaching students in accordance with their aptitude" in teaching. Teachers should pay close attention to the teaching focus, keep up with the pace of the times, use advanced teaching concepts and intelligent teaching thinking methods, make full use of the intelligent teaching

environment to provide different teaching services for students, and make students' personalized development possible.

4. Path of Teacher Professional Development in the Context of Smart Education

In the context of smart education, teacher professional development has been endowed with rich connotations and characteristics of the times. How to seize the opportunity of development to promote education and social change requires the system support provided by society at the level of security, as well as the technical support provided by schools at the level of environmental creation, and more importantly, teachers need to practice themselves at the level of self-development and innovate teaching models at the teaching level. In this way, teachers can inject more fresh vitality into their professional development and social transformation.

4.1. Social Level: Strengthen Policy Guidance and Deepen Smart Education Understanding

4.1.1. Strengthen Macro Policy Guarantee

China attaches great importance to the development of smart education, and has also successively issued a series of policy documents such as the "The 13th Five-Year Plan for Educational Informationization" and the "Action Plan for Educational Informationization 2.0" to promote the development of smart education. The education administrative department should strengthen the policy guidance, control the evaluation mechanism of teacher professional development, and then refine the project indicators of teacher professional development. For example, the information literacy, information skills, learning ability and other indicator systems necessary for teachers under smart education are divided. Each indicator system can be subdivided into two and three indicator systems. The big data platform is used for real-time dynamic monitoring, and the level and score of teachers under each indicator system are analyzed, and a personalized advanced model of teacher professional development is established accordingly.

4.1.2. Deepen Smart Education Understanding

Teachers are the main body supporting intelligent education. Just as the early social division of labor promoted the professionalization of teachers, the current information society also has a profound impact on the professional development of teachers, forcing teachers to recognize the urgency of role transformation. To make teachers jump out of the "comfort circle", it is necessary to deepen teachers' understanding of wisdom education and externalize it into action, and stimulate teachers' internal motivation through the reverse force mechanism. At the same time, we should build a lifelong teacher development training model that integrates "pre-service and after-service" to meet the needs of teachers in the era of smart education, develop and implement a national public service sys-

tem for teacher training aimed at enhancing teachers' intelligent teaching ability, issue guidelines for teacher training courses, develop standards for teachers' data literacy, and cultivate teachers' talents from the perspective of smart education.

4.2. School Level: Create Smart Environment and Improve Teacher Training System

4.2.1. Build Intelligent Learning Environment

The construction of intelligent environment can provide material guarantee and technical support for teacher professional development, which is also the key to the rapid improvement of teachers' information skills and literacy. The connotation of intelligent education, on the one hand, it is to promote learners to learn intelligently by creating an intelligent learning environment and using intelligent teaching methods, so as to cultivate people with high intelligence and creativity. On the other hand, learners use information technology to intelligently participate in various practical activities, and constantly create products and values to achieve adaptation, transformation and selection of learning environment, living environment and working environment.

It can be seen that the professional growth of teachers needs to create a good intelligent learning environment, use the network technology and data resources of the intelligent education platform for information integration and data processing, and then optimize the data environment to provide professional and personalized growth space for teachers. Starting with the construction of smart campus, we will focus on the construction of smart classrooms, smart libraries, smart laboratories and other smart functional rooms. Through the interconnection of smart platforms, we will establish communication channels between teachers, jointly improve the educational function of the virtual platform, and further promote the progress of teacher professional development (Yang & Yu, 2015).

4.2.2. Develop Intelligent Teaching Activities

The creation of smart environment is the investment of software and the construction of resource base, especially the organization construction and human resource allocation. With the help of smart learning space, teachers can strengthen the trust and connection between each other and form different smart learning communities. Through online communication and interaction, teachers with the same discipline background gradually form a discipline community, that is, a homogenous community. We share teaching experience and practical experience with each other, and achieve common progress through continuous reflection, induction, summary and cooperation with others. Teachers with different academic backgrounds build heterogeneous communities in network interaction based on different concepts, specialties and cognition. The construction of heterogeneous communities breaks the boundaries of different disciplines and cultures, and helps to cultivate teachers' interdisciplinary and cross-cultural thinking (Cheng, 2018).

4.2.3. Improve Teacher Training System

Teachers are unable to adapt to the upgrading of technology from the perspective of smart education, and the serious lack of use of technology is a major problem in teachers' professional development at present. Schools should focus on building a training system adapted to the development of smart teachers.

On the one hand, schools should actively carry out comprehensive technical training, targeting all teachers, and help all teachers form awareness of intelligent education and master certain intelligent teaching abilities and skills. The training provided by the school should have the characteristics of normalization and continuity, help teachers to have the idea and ability of innovative application of intelligent education as soon as possible, so as to give students personalized guidance on teaching resources.

On the other hand, in the process of training, the school should pay attention to the full combination of theoretical guidance and practical operation, and provide teachers with supporting operation manuals, knowledge handouts and other materials during theoretical explanation, so that teachers can deepen their knowledge impression and consult the training content. At the same time, in practice, trainers should provide operational opportunities for every college teacher who receives training. Let them try the function of the intelligent education system under the guidance of the trainer, complete the operation process independently, and gradually improve the proficiency of the intelligent teaching technology operation.

4.3. Teacher Level: Renew Teaching Concepts and Advocate Lifelong Learning

4.3.1. Change Traditional Teaching Concepts

At present, the demand of the public for autonomous learning and personalized learning is becoming increasingly strong, which has led to the gradual change of the traditional teaching mode. The "digital natives" living in the information age are also more skilled in the use of information technology. These changes have prompted teachers to break the traditional teaching concepts and quickly adapt to the teaching methods of the information age. This is not only conducive to the professional development of teachers themselves, but also conducive to triggering changes in all levels and aspects of education, and ultimately promoting the formation and development of new forms of education. With the help of information technology, especially the power of intelligent information technology, to build an intelligent online learning environment, teachers as learners can enjoy superior and humanized learning services in the online virtual space, thus completing the teaching and internalization of knowledge.

4.3.2. Improve Unique Teaching Art

Every teacher should be an independent individual, and should have unique teaching methods and teaching arts, so that students can understand, accept and use knowledge. This kind of teaching charm can bring students great emotional touch, and then get more ideal teaching effects, which is beyond the reach of any

simple advanced technology. As a unique individual, teachers have the richness, diversity and personality of human beings, which is of educational significance. From a certain point of view, technology is the result of universality rather than individuality. Teachers should make technology become the assistant of individuality through effective processing and application.

4.3.3. Establish Lifelong Learning Concept

From the perspective of the needs of the times, the former advantages of the teacher community as a knowledge holder no longer exist in the context of intelligent education. Therefore, teachers must have an open mind and establish the concept of lifelong learning. From the perspective of the internal needs of personal development, teachers, as educators, have always been in dynamic change. A successful educator can always break through many obstacles and constantly move forward into the future. The internal motivation that supports teachers to keep moving forward and constantly surpass themselves comes from the role of teachers as learners. The era of intelligent education is an era of innovation and development. Teachers should constantly practice the concept of lifelong learning in practice and make their own contributions to the construction of lifelong learning system.

4.3.4. Enhance Mutual Cooperation Spirit

In traditional teaching, most teachers "build cars behind closed doors". On the one hand, it is difficult to obtain innovative resources, and on the other hand, many excellent teaching achievements cannot be promoted and applied. In the era of smart education, teachers should have the spirit of mutual assistance and cooperation, and can absorb and update teaching methods and concepts in time through the smart education learning platform. Teachers can also display their teaching research results, share their teaching ideas, and share, explore and innovate with other teachers through various resource banks or teaching websites, so as to promote the vigorous development of education.

4.4. Teaching Level: Update Teaching Thinking and Innovate Teaching Mode

4.4.1. Cultivate Student Core Literacy

When the trend of technology supporting education becomes more and more prominent, we should pay more attention to the ideological value guidance of students. Smart education can innovate knowledge transmission ways and classroom teaching methods, but it cannot replace the unique value of "educating people" of teachers. In 2016, the "Core Literacy of Chinese Student Development" was released, focusing on the cultural heritage (including humanistic feelings, aesthetic tastes, cultural accumulation, etc.) and scientific spirit (including critical questioning, courage to explore, rational thinking, etc.). The era of smart education is not only an era of mutual sharing of educational resources, but also an era of innovation and creation. Smart education emphasizes not only

"intelligence", the cultural basis of knowledge, but also "wisdom", the cultural basis of wisdom. Teachers should have the idea of cultivating talents with core literacy as the orientation, always maintain the idea of "pioneering, innovative and enterprising" in the process of professional development, focus on the formation of students' character, personality shaping, humanistic care, and focus on cultivating students' creative thinking ability.

4.4.2. Break Teaching Thinking Habit

Today's students were born and grew up in the digital age, and have been surrounded by new technologies for a long time. Mobile phones, computers and other digital information tools have had a huge impact on their way of thinking, behavior habits, behavior style, etc. Facing such learners, teachers not only need to have the educational and teaching ability of technology integration and application, but also need to generate design thinking and break the teaching thinking habit. In the perspective of smart education, teachers should pursue the goal of "technology change learning", based on the different characteristics of students and their existing knowledge, find the best solution to problems, increase practical wisdom, and generate technology-integrated teaching knowledge. Teachers need to constantly reflect and practice, and have design thinking, so that they can better improve their teaching ability and develop and design curriculum content, and adapt to the requirements of technology-integrated teaching in the era of intelligent education.

4.4.3. Strengthen Teacher-Student Interaction

True education is based on mutual respect and equal exchange between teachers and students. In the era of intelligent education, the significance of both teachers and students as teaching subjects can be highlighted. On the one hand, teachers should be good at communication and coordination, actively observe and explore students' learning needs, and guide students to better complete their learning tasks in real time, so that students can be in an equal, democratic and harmonious learning atmosphere, and constantly strive to build their own knowledge resource base, construct and innovate knowledge structure, focusing on actively planning resources, designing teaching and resource use.

On the other hand, strengthening teacher-student interaction is the driving force for the sound development of smart classroom. Learners and teachers are in a relatively virtual space environment, which is different from the traditional classroom learning environment. In order to further improve the learning quality, teachers should actively strengthen the interaction between teachers and students. Through the intelligent communication platform, we can understand students' learning needs, help solve problems, and promote emotional exchanges between teachers and students, so that students can be in an equal, democratic and harmonious learning atmosphere.

4.4.4. Innovate Smart Teaching Mode

First, we should improve information literacy and build a student-oriented

teaching model. The rise of smart education will help students to personalized learning. Teachers need to constantly improve their information literacy and make the personalized development of each student possible. On the one hand, when preparing daily teaching courseware and arranging teaching resources, teachers will contact and apply a large number of information data and materials. Teachers need to have the skills of screening, analyzing, integrating and applying information to help students select information that is efficient, consistent with the learning theme and suitable for students' personalized development, and better assist students in effective learning. On the other hand, students will leave a lot of data about preferences and behaviors when learning in the smart education environment. Teachers should be good at using learning analysis technology to reasonably analyze and understand the data about students and learning environment, so as to better promote the personalized development of students.

Second, we should develop a teaching model characterized by autonomy, cooperation and inquiry. In today's highly developed science and technology, active participation, good cooperation, and willingness to explore are essential qualities for talent development. It can even be said that these three factors are important factors affecting future social adaptation and national strength competition. The rise of smart education can help students understand more, experience more and learn more. The most important thing for students as "digital natives" is not the memory of knowledge, but the promotion of wisdom. From the perspective of smart education, the focus of teachers' work should be inclined to teaching characterized by autonomy, cooperation and inquiry to promote the development of students' thinking.

5. Conclusion

The rise and promotion of smart education are a process of continuous development and evolution. In this process, smart education has brought impact on teacher professional development, but also provided support for teacher professional development. Teachers should actively respond to the impact of smart education, focus on the guidance of students' core quality values and the implementation of creative work, convey emotions, cultivate personality, develop personality, carry out educational and teaching practice activities around students' personalized needs, and promote students' all-round development. In addition to the efforts of teachers themselves, schools and governments should seek breakthroughs and make efforts in various ways to provide various kinds of support for teacher professional development, so as to build a high-quality and high-level teacher team in multi-dimensional and multi-level ways.

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