

Research on the Path of College Teachers' Role Transformation in the Smart Education Environment

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Abstract

With the in-depth application of artificial intelligence, AR/VR, big data, 5G and other emerging technologies in the field of education and teaching, human education is transforming and evolving to the stage of smart education. The connotation and characteristics of "smart education" require teachers to improve their professional ability under the premise of mastering the theoretical concepts such as constructivism and connectionism, and finally realize the transformation of their roles in the teaching of "wisdom education". On the basis of combing the relevant education and teaching theories under the smart education environment, this paper summarizes the transformation of teaching characteristics, the characteristics and direction of teachers' role transformation and the difficulties faced by teachers' role transformation brought by smart education, and puts forward the realistic path of teachers' role transformation under the background of smart education in combination with the reality of our school.

Keywords

Smart Education; Teacher's Role; Transformation Path.

1. Introduction

With the information technology revolution spreading to the field of education, teaching environment, teaching concept, educational content and educational means are all quietly changing. In this change, as the main body of teaching, the role of teachers is bound to be impacted. The biggest influence is to subvert the dominant position of teachers in teaching activities in the past and change their social roles. So how should college teachers cope with a series of changes brought by this technological change, realize their own transformation and development, better adapt to the teaching environment and cultivate more talents needed by society, which is an urgent problem for us to solve.

2. Relevant Education and Teaching Theories

2.1. Smart Education

Smart education is an educational model that combines information technology and educational ideas. It uses advanced technologies, such as artificial intelligence, big data analysis, virtual reality, etc., to improve the teaching and learning process and promote students' personalization, interaction and deep learning. The core goal of smart education is to provide more effective and efficient teaching and learning experience. It emphasizes personalized education and provides personalized learning paths and resources according to students' characteristics and needs. Through big data analysis and learning analysis, teachers can better understand students' learning situation and give targeted guidance and support. In addition, smart education also expands the teaching content and methods [1-2]. By using educational science and technology tools and resources, teachers can create diverse learning resources and

activities, and stimulate students' learning interest and creativity [3]. Smart education in the information environment can be traced back to the "Dacheng Wisdom" advocated by Mr. Qian Xuesen as early as 1997, and the English translation he proposed is called "Science of Wisdom in Cyberspace". In recent years, the development of smart education has been strongly supported by national policies. The Central Committee of China has successively issued notices such as "China Education Modernization 2035", "Implementation Plan for Accelerating Education Modernization (2018-2022)" and "Opinions on Promoting the High-quality Development of Modern Vocational Education", demanding innovative educational service formats, situational teaching, integrated and intelligent teaching, and promoting the deep integration of modern information technology and education and teaching to improve teaching quality.

2.2. Constructivism

Constructivism is a social science theory, the earliest proposer can be traced back to Piaget in Switzerland.[1]the constructivism is based on his view of children's psychological development. He believes that "knowledge is actually constructed in the interaction between subject and object." On this basis, Robert Jeffrey Sternberg and others emphasized the key role of individual initiative in the process of constructing cognitive structure, and Vygotsky revealed the theory of zone of proximal development, which improved and developed constructivism. Generally speaking, constructivism means that human cognition and social interaction play an important role in the construction of knowledge and reality. Its core ideas include: (1) the construction of knowledge: Constructivism holds that knowledge is not only discovered or accepted, but is constructed through the interactive process between individuals and society. Everyone interprets and understands the world through their own processes of perception, memory, understanding and meaning giving, which are influenced by personal background, culture and language. (2) The importance of social interaction and language: Constructivism holds that social interaction is the key to knowledge construction. In the communication and interaction with others, people share experiences, use language and symbols to construct meaning together, and adjust and change their own cognition. (3) The influence of cultural and social background on cognition: Constructivism holds that factors such as culture, social environment and language have an important influence on individual cognition and understanding. Different cultural and social backgrounds will shape people's way of thinking, values and knowledge structure, thus affecting their perception and interpretation of the real world.

2.3. The Application Mode of Mixed Teaching and Man-machine Cooperation

Blended teaching refers to the teaching mode that combines traditional face-to-face teaching with online learning. This model can enhance students' learning experience and participation through online courses, online discussions and virtual laboratories. In blended teaching, students can study online and participate in face-to-face classroom activities according to their own learning rhythm and needs. Man-machine collaboration refers to the cooperation and collaboration between people and computers, especially in the teaching process. In this teaching method, teachers and students can use computer software, application programs and online platforms and other technical tools to achieve teaching goals together. The application modes of these two teaching methods can be designed according to the specific teaching needs and the characteristics of student groups. For example, online learning elements can be introduced into the classroom, such as watching online course videos and conducting online group discussions, so as to promote interaction and cooperation among students. In addition, we can provide richer learning experience and practical opportunities by using teaching tools, such as virtual laboratories and simulation software.

3. The Transformation of Teaching Characteristics in the Smart Education Environment

3.1. Learning Individuality

Smart education environment can provide personalized learning content and learning path according to students' different needs, interests and learning progress through learning analysis and artificial intelligence technology. Because learners have unique characteristics and needs, teachers can make targeted learning plans, emphasizing the design of teaching content and methods according to learners' interests, abilities, learning styles and other factors, which can enhance students' learning motivation and confidence, help learners understand and master knowledge better, it also can improve their learning interest and improve learners' learning effect and satisfaction [4].

3.2. Learning Autonomy

Smart education environment provides various online learning resources and tools, which enable students to have the ability of self-decision, self-organization and self-evaluation in the learning process, actively set learning goals, choose suitable learning resources and methods, arrange learning time, monitor learning progress, and evaluate and reflect on learning results. At the same time, learners can effectively manage their own learning time, learning tasks and learning resources, so as to improve the learning effect [5].

3.3. Learning Cross-border Integration

Smart education environment integrates various disciplines, technologies and resources to promote cross-integration and comprehensive learning among disciplines. Students can acquire more extensive knowledge and skills through interdisciplinary projects and virtual laboratories. Specifically, it can promote students to actively understand and learn knowledge and skills in other fields, such as art, science and technology, economy and so on. Through various learning, we can have the opportunity to combine different fields of thinking with knowledge, and cultivate the ability of problem-solving, innovative thinking, critical thinking and teamwork ability.

4. The Transformation of Teachers' Role in the Smart Education Environment

4.1. From Knowledge Disseminator to Knowledge Designer

Smart education environment provides a large number of learning data and analysis tools. Teachers need to be familiar with and reasonably integrate these technologies and tools. Through the collection and analysis of students' learning data, they can understand students' learning situation and progress. Teachers can provide personalized guidance and support according to learning data to help students solve learning problems and improve learning strategies.

4.2. From Teaching Master to Teaching Guide

By guiding students to make rational use of intelligent education technology and online learning resources, we can help students make learning plans, solve problems, provide feedback and evaluation [6]. Teachers should pay attention to students' individual needs and learning progress. They can choose appropriate learning resources and activities according to students' interests and abilities, and stimulate students' learning motivation and creativity by combining online discussion and project cooperation.

4.3. From Classroom Lecturers to Classroom Mentors

In the era of smart education, teachers should not only guide students to choose learning resources and design learning strategies, but also pay attention to the change of students' ideological values, pay attention to individual emotional fluctuations after setbacks, and actively adjust students' learning mentality [7]. Guiding students to form correct value cognition, maintaining and regulating students' psychological and emotional needs, standardizing scientific and technological activities, strengthening scientific and technological ethics education, helping students to establish correct scientific and technological ethics awareness and virtue, and keeping the bottom line of scientific and technological ethics, become the guide of casting the soul and educating people [8].

5. The Dilemma of Teachers' Role Transformation in the Smart Education Environment

5.1. Technology Application Pressure

With the popularization and development of education technology, teachers need to master and apply various new technical tools to teach. With the continuous development and progress in the field of technology, new educational technology tools and platforms emerge one after another, which may be a challenge for some teachers. Some teachers may be unfamiliar with using new technology tools and do not know how to operate and apply them to teaching, so they need to constantly learn and adapt to new skills and tools. At the same time, other teachers, out of their worship of intelligent technology and one-sided understanding of intelligent education, regard some new technologies of intelligent education as their right-hand man to liberate themselves, which makes their teaching subject position give way to intelligent education technology. So that the classroom becomes the home of intelligent machines to answer questions, while the teachers become "transparent people" in the educational field.

5.2. Changes in Teaching Methods

Smart education emphasizes students' active participation and autonomous learning. Compared with the traditional teaching mode, this requires teachers to take more guiding and guiding roles than just imparting knowledge. Some teachers may need time to adapt and change their teaching methods. Changing the existing teaching methods may encounter students' resistance, because they may have become accustomed to the traditional teaching methods and are unwilling to accept new methods. And to promote the change of teaching methods, teachers need to receive training and support to familiarize themselves with new teaching methods and tools. At the same time, it may be necessary to use new teaching tools, technical equipment and resources, but it is limited by resource factors such as budget, equipment and network.

5.3. Limitation of Educational Resources

Although smart education provides many new teaching tools and resources, not all schools and teachers can get enough resources to support their transformation in smart education. Sometimes, teachers may face the problem of limited resources, which may affect their development and implementation in smart education. For example, the financial budget of educational institutions may be limited, which may limit the ability to purchase teaching equipment, technical equipment, teaching materials and other educational resources. In the digital age, educational scientific and technological equipment such as computers, tablet computers and Internet access are very important for teaching. However, some educational institutions may face the problem of insufficient equipment or low quality equipment. Teachers also lack appropriate training and teaching materials resources, which are not enough to cope with the ever-changing teaching needs and the diverse needs of students.

5.4. The Role of Teachers is "Digital"

The advantage of smart education urges some teachers to combine artificial intelligence with exam-oriented education, which breaks the balance between instrumental rationality and value rationality and narrows the possibility of students' development to "score first". Improving students' grades has become the main pursuit of teachers' educational life, and teachers have been alienated into "teaching machines". Intelligent teaching evaluation system only takes data parameters as operation rules, and can only evaluate students' "homogeneity" from a linear perspective, but cannot analyze students' "heterogeneity", which may hinder students' personalized development [9].

6. The Path of Teacher's Role Transformation in the Smart Education Environment

6.1. Uphold the Concept of Smart Education, Adhere to Lifelong Learning

Teachers should strengthen their own technical ability and be familiar with and master all kinds of technical tools and platforms needed for smart education. This includes learning to use online teaching platform and learning management system. First of all, we can learn about the latest teaching methods, educational technology tools and resources, such as multimedia teaching, online assessment and learning management system, by attending seminars, training courses and workshops, so as to enhance the teaching effect [10]. Secondly, we should actively use the Internet and online learning platform to obtain teaching resources and exchange experiences, join the educational community, communicate and interact with other teachers, and learn and grow together. In addition, it is more important for teachers to reflect on their own smart teaching concepts, always maintain the life consciousness of human teachers, and rationally handle the relationship between themselves and smart education technology, so as to avoid becoming the "holder" of technology in teaching practice.

6.2. Pay Attention to the Generation of Students' Wisdom and Innovate the Current Teaching Methods

Teachers can try to adopt more interactive and personalized teaching methods to encourage students to actively participate and cooperate. Traditional teaching process is usually teacher-centered, while modern teaching pays more attention to students' active participation and interest in learning. Teachers can adopt student-centered teaching methods, such as group cooperative learning, project learning and inquiry learning, to guide students to actively explore and construct knowledge. Reverse classroom is also a teaching mode. Teachers provide preview materials for students to study independently before class, and real classroom time is used for discussion and practice. This method can stimulate students' thinking and participation. Teachers can use a variety of teaching strategies and methods, such as explanation, demonstration, problem solving, case study, etc., or realize personalized teaching through individual counseling, group differentiated learning and evaluation to meet the learning needs and learning styles of different students.

6.3. Create a Smart Learning Environment and Improve the Resource Integration Mechanism.

Teachers can integrate various learning resources, including network resources, e-books, video tutorials, etc., to meet students' personalized learning needs. At the same time, teachers can also use the technology platform to provide students and parents with learning support and feedback [11]. First of all, the school can establish a teacher teaching resource database or an online platform for teachers to exchange and share educational resources and experiences. The platform can include teaching videos, teaching plans, research results, etc., which can reduce

teachers' repeated production of the same courseware and resources and improve teaching efficiency. Secondly, teachers' teams can be formed, so that teachers of different subjects or grades can cooperate in preparing lessons, exchanging experiences and teaching design. Through cooperation, teachers can learn from each other, solve difficult problems in teaching together and improve teaching quality. In addition, the curriculum can be integrated, and the cooperation and cooperation among teachers can be enhanced through interdisciplinary teaching and project-based learning. This can break the discipline barrier, give full play to the comprehensive strength of teachers' schools and improve the quality of education.

6.4. Shape Intelligent Teachers and Improving the Integrity of Teachers' Roles.

Teachers especially need to pay attention to the all-round development of students' morality, intelligence, physique, beauty and labor. By enriching and expanding the contents and forms of physical education and labor education, we can strengthen the integration of students' mental and physical development into their own life growth, enhance their embodied cognitive ability, enhance their sense of the meaning of their own lives, and make them become mature "capitalized people".

Machines can only solve problems, not find them, so teachers must try to use various evaluation methods, such as project works, reports, exhibitions, etc., to comprehensively evaluate students' learning effect and performance under the background of man-machine collaborative teaching. The diversified evaluation method of teaching can help teachers fully understand students' learning situation and ability development, so as to better guide and support students. First of all, through students' homework and project works, teachers can evaluate students' practical application ability, creative thinking and problem solving ability. Secondly, teachers can observe students' behavior, participation and interaction in class and evaluate students' performance in group cooperation, discussion, demonstration or presentation, and examine their communication ability, teamwork ability and leadership ability. By asking questions to students, teachers can understand their understanding and thinking ability of knowledge. Finally, encouraging students to evaluate their learning situation can cultivate their self-awareness and sense of responsibility [12].

It should be noted that each teacher may have a different starting point and development direction in the path of role transformation, so personalized planning and adaptation is very critical. At the same time, teachers can also promote the transformation of teachers' roles under the background of smart education through interaction and cooperation with peers, education experts and relevant institutions.

Acknowledgments

The paper is supported by Combined Online and Offline Courses of Provincial Quality Engineering for Colleges and Universities in Anhui Province (No. 2021xsxxkc009) and teaching research project of Anhui University of Finance and Economics (No.acjyzd2021022).

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