

Research on Teachers' Role Orientation and Strategies in the Age of Artificial Intelligence

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Abstract: In the era of artificial intelligence, artificial intelligence and other information technologies have permeated all aspects of education, changing the shape and way of existence of education. Teachers, as the main practitioners of education, are the key elements and core driving force of education implementation, which puts forward new challenges and requirements for the role of teachers. This paper analyzes the realistic motivation of the teacher's role change in the age of artificial intelligence from the perspectives of educational media, educational time and space, and educational goals. It also explores the new positioning of teachers' roles in the age of artificial intelligence from four levels: education and teaching, student development, technology application, and teacher development, and proposes effective strategies for the positioning of teachers' roles in the age of artificial intelligence, with a view to enabling teachers to cope with the risks and challenges posed by technology in the age of artificial intelligence.

1. Introduction

With the booming development of the Internet of Things (IoT), cloud computing, artificial intelligence (AI) and other new-generation information technologies and their deep integration in the field of education, education is advancing towards informatization, digitization, and intelligence at an unprecedented speed, marking the fact that mankind has formally stepped into a new era of artificial intelligence. As an important change force to promote the development of society, the application of artificial intelligence in the field of education is becoming more and more extensive, which not only greatly promotes the informatization and digitization process of education, but also realizes the intelligent upgrading of education. It has shown incomparable potential and role in many aspects of education teaching, campus management and education governance, bringing revolutionary changes to education. As the main practitioners of education, teachers are the key element and core driving force in the implementation of education, and the era of artificial intelligence has put forward new challenges and requirements for the role of teachers[1]. Therefore, clarifying the realistic motivation of teachers' role change in the age of artificial intelligence, grasping the new positioning of teachers' roles, and exploring the effective strategies of teachers' role positioning are the proper meaning of better educational practice.

2. The realistic motivation of teachers' role change in the age of artificial intelligence

New technology and new methods promote the change of education, at the same time, it also causes the conflict of teachers' understanding of their own roles, this paper will analyze the real motives of teachers' role change in the era of artificial intelligence from the perspective of educational media, educational time and space, and educational goals.

2.1 Intelligent perception of education media change

In the era of artificial intelligence, the rapid development of media technology has redefined the way of human knowledge production, acquisition and dissemination. Intelligent educational media can automatically analyze the learning characteristics and learning data of learners, push personalized learning resources, give timely feedback on learners' learning, and provide more targeted learning for students. This intelligent perception of the education media will cause a great impact on the relationship between teaching and learning, but also profoundly affect the change of the role of teachers.

First of all, with the support of Internet of Things (IoT) technology, the interconnection of everything greatly enhances the carrying capacity of educational resources and breaks the equilibrium between supply and demand between massive information resources and teachers' teaching. In the face of huge and abundant educational resources, it is difficult for teachers to choose the appropriate teaching content and easy to lose their way in the ocean of resources. Secondly, the teacher-student relationship is no longer a simple teaching-learning relationship in the past, and knowledge transfer is no longer the traditional one-way dissemination by the teacher, and the intelligent educational media can provide learners with rich and accurate learning resources. Therefore, in the age of artificial intelligence, teachers are not only propagator of curriculum knowledge, but also planners of students' learning and guides of ideology and morality, and pay more attention to the connection between the heart in teacher-student relationship. Finally, the intelligent, personalized, and specialized features of media technology have made large-scale personalized education a reality, and have prompted teachers to begin reflecting on what kind of role they will continue to exist in, and society's expectations of teachers' roles have become higher and higher, requiring teachers to have a more specialized knowledge base related to pedagogy, psychology, and information technology processing skills.

2.2 Educational space-time shift in the fusion of reality and fiction

Compared with the traditionally blocked, monotonous and physical educational time and space, in the age of artificial intelligence, the combination of reality and reality is the biggest characteristic of educational space-time in this period. The so-called virtual-reality integration is a teaching space with blurred boundaries between reality and virtual reality built on the basis of "augmented reality(AR) " and "virtual reality(VR) " technologies. AR is the projection of the virtual world into the real world, thus realizing the "augmentation" of the real world[2]. VR is the use of real-world data, through computer-generated electronic signals, to create a computer-simulated virtual world, the user can operate in this virtual world and get the most realistic feedback on the environment[3]. The application of AR and VR in the field of education provides a new way of expression for teachers' teaching and builds a virtual-reality fusion educational scene for students' learning.

In the educational scenario where the real and the imaginary are intertwined, education exhibits the characteristics of borderlessness and openness. First, education in the age of artificial intelligence is borderless, and the places where teachers and students interact are not only standardized physical space classrooms and campuses, but can also be taught in virtual spaces.

Traditional schedules are also able to be replaced, allowing teachers and students to break through the constraints of time and space and study at any time and any place. Teachers need to reflect on teaching models in virtual environments and update their teaching concepts, curriculum, and instructional design to focus on the learning needs of different learners. Secondly, education in the age of artificial intelligence has a great deal of openness. The openness of information resources, mankind is currently in the era of information explosion, a variety of information and knowledge in the network for dissemination and exchange, resulting in the collision and integration of ideas. The openness of learners, with learners of different social status, family backgrounds and literacy levels participating in education by forming learning communities with like-minded people according to their needs and interests. The openness of the exchange space, where learners are able to choose different virtual learning communities according to their learning needs rather than being confined to a particular learning community, is characterized by autonomy and mobility. Therefore, teachers need to change their original teaching concepts, guide students to learn how to learn, and promote a self-directed learning model.

2.3 Goal-oriented education for intelligent education

With the continuous enhancement of intelligent technology, human-centeredness has become the primary task of teachers, who can only stand firm in the age of artificial intelligence by grasping the core goal of intelligent education and exerting their unique value in education. Technology is only a means to achieve intelligent education; human-centeredness is the starting point and destination of education, and promoting human development is the ultimate goal of teachers' educational activities. As many scholars have called for: in the era of artificial intelligence, intelligent machines can not replace people to complete the educational goals, the value of teachers lies in the missing part of the intelligent machine, the future of education can only move towards human-machine cooperation, in order to better promote the development of the cause of education, so as to promote the physical and mental all-round development of the educated person, so as to make the person become a complete and intelligent person, and to realize the intelligent education. Teachers need to possess basic knowledge of information technology and a sense of innovation, and be able to transform this knowledge into the professional competence of teachers required by intelligent education, adapt to teaching in virtual and real, borderless and complex educational scenarios, and show a certain degree of creativity and generativity in the educational process.

3. Appropriate Positioning of Teachers' Roles in the Age of Artificial Intelligence

Prompted by three realistic motivations, namely, the change of education medium of intelligent perception, the transformation of education time and space of virtual-real integration, and the orientation of education goal of intelligent education, the role of teachers in the age of artificial intelligence will inevitably undergo a transformation. Some of the competencies of teachers will be replaced by smart devices, but this does not mean that teachers lose their key position in the education system; rather, it puts higher demands on their competencies, and this part of their competencies that will not be replaced by smart devices will become the foundation of teachers. From this perspective, this study will explore the role of teachers at four levels: teaching and learning, student development, technology use, and teacher development.

3.1 Role orientation in education and teaching

Changes in the purpose and content of teachers' teaching determine changes in their roles. In terms of the purpose of education, it is necessary to adhere to the human-centred approach, focus on

the personalized development of students, and be a designer of personalized teaching; in terms of the content of education, it is important to improve and develop the ability to understand and integrate knowledge, and to be a constructor of curricular knowledge; and in terms of the theory of teaching, it depends on one's own learning and creativity, and continuous reflection in practice, and to be an innovator of educational theory.

3.1.1 Designer of individualized instruction

The purpose of education in the age of artificial intelligence needs to be predicated on personalized teaching. Intelligent technology frees teachers from repetitive, mechanized educational activities and allows more time for creative work that AI cannot replace. With the support of smart devices, teachers can analyze students' learning data and learning characteristics, understand students' learning needs, and provide targeted personalized services for students. They can also provide accurate personalized education to students by giving them guidance according to their interests and characteristics.

3.1.2 Constructors of curriculum knowledge

With the development of interconnected technology, the amount of knowledge is growing in an explosion, and the acquisition of knowledge has become very easy, and the knowledge from different media, different subjects and different ways is in a rapid, fragmented, generalized, instantaneous, and casual posture, so that individuals are either passive or active. If teachers still use the traditional classroom knowledge to impart knowledge to students, forcing students to learn by rote and burying their heads in a sea of questions, they will be eliminated by the times. Teachers need to break through the fragmented knowledge teaching model of the past, integrate various kinds of knowledge, promote the organic connection between old and new knowledge, and construct learning rich in content, and sometimes interdisciplinary teaching. Therefore, in addition to declaring knowledge to students, teachers should do more to process and understand the information, to construct their own curriculum knowledge system, as well as to help students to complete the construction of knowledge experience, and to be the constructor of curriculum knowledge.

3.1.3 Innovators of educational theories

Artificial intelligence replaces the repetitive and tedious part of the teacher's work and solves simple problems, while the complexity of the educational problems faced by teachers is increasing and the innovation of educational theories is becoming more and more important. As Rogers observes, "Teachers can't be stuck in the educational paradigm of the past; advances in technology require them to be future-oriented and innovative." [4] In the context of the new era, teachers are faced with new problems, new phenomena, and new rules, all of which require them to tap into new perspectives and new ways of thinking. Teachers should become innovators of educational theory, which is conducive to their occupying the main position in educational practice, taking the initiative to explore and try to solve educational problems, refining educational experience and generating educational wisdom.

3.2 Role orientation in student development

Role orientation in student development focuses mainly on the role of teachers in the process of learner development. As education focuses on building moral character, the main task of teachers is not only to impart knowledge, but also to take the responsibility of paying attention to students'

mental health and strengthening their moral cultivation. Teachers should be analyzers of students' accurate assessment, planners of students' career development, and communicators of students' spiritual growth.

3.2.1 Analysts of students' accurate assessment

Teachers using AI can quickly and accurately evaluate and provide feedback on students' knowledge acquisition and even cognitive processing, and based on this, provide learning materials that are appropriate to the learners' level and enrich the learners' choices. AI can replace some of the roles of teachers, helping them to improve teaching efficiency and reduce the teaching load. As analysts of students' accurate assessment, teachers need to give timely feedback on students' comprehensive status, especially academic level, mental health, attitudes and values; tap students' potentials and their abilities in various aspects based on their learning, and make teaching plans; assess students' abilities in complex situations, and guide students to know themselves and society.

3.2.2 Mentor for students' career development

AI is able to use students' academic performance and psychological state data in various periods to depict students' individual portraits, analyze students' ability development characteristics as a whole according to scientific algorithms, assess students' personal strengths and advantages, recommend suitable subjects and majors for students and give them development advice. However, such a suggestion is strongly instrumental and lacks the emotional color of a "human being". Teachers, as "human beings", cannot be absent from the development planning of students. When teachers become the mentors of students' career development, they can help students to know themselves better through specific and concrete courses and programs, and to find what they are really interested in in their activities. More importantly, teachers need to stand for the development of the country and society, and guide students to discover and explore careers that are of interest and importance, and for which there is a shortage of talent in the country.

3.2.3 Communicator of students' spiritual growth

Smart technology can quickly replace humans in some repetitive, easily observable and quantifiable hard skills, but soft skills such as expression and communication, empathy and caring still have to rely on teachers. Especially in the online classroom, smart machines can play a supporting role, but they cannot replace the sincere companionship given by teachers. Regardless of the level of technological advancement, a teacher's example, emotional flow, and face-to-face interaction is an important step in preparing students for adulthood. Teachers play an important role in understanding the emotional and psychological well-being of students, and their role in counseling and stress management becomes even more important in the face of the complex and borderless learning environment in the age of artificial intelligence. Teachers should utilize the unique human emotions, observation, and inner perception to seriously and equally dialogue with students, listen to and observe the state of the students, and through emotional investment and attentive care, thus inspire their democratic spirit, rationality of independent thinking, so that they can have a healthy development of their spirit, and to become a communicator of their spiritual growth[5].

3.3 Role orientation in technical application

In terms of technology application, emerging technologies represented by artificial intelligence are no longer used as auxiliary tools, but in an embedded and integrated posture, which has a

significant impact on education. Teachers, while applying intelligent technology, should focus on its impact on social ethics, and be the enabler of human-computer synergistic education and humanistic penetration of technology.

3.3.1 Enabler of human-computer collaborative education

The use of artificial intelligence enables teachers to become collaborators, teaching alongside AI teachers, enabling human-machine collaboration and driving the realization of a wisdom-based education. Truly integrated online and offline teaching requires the integration of artificial intelligence, multimedia resources, data analytics and other elements that reflect the unique advantages of information technology[6]. As an enabler of human-computer collaborative education, on the one hand, AI helps teachers to understand and research the educational object in an all-round way, and provides the necessary technical support for teachers to carry out highly creative teaching work; on the other hand, the intelligent medium expands teacher-student and student-student interactions to human-computer interactions, and the teachers are skilled in applying different teaching strategies to carry out high-quality classroom teaching, so as to realize the in-depth fusion of AI and education.

3.3.2 Follower of humanistic infiltration techniques

Understanding the dual attributes of technology and the object of education is fundamental to the teacher's educational endeavors. Teachers in the age of Artificial Intelligence should always be nurturing and human-centered, and become concerned with humanistic penetration of technology. In terms of technological attributes, it avoids behaviours that generate over-reliance on technology or over-pursuit of maximizing the benefits of tools, focuses on the emotional needs and psychological guidance of students, and takes the establishment of morality and humanism as the fundamental purpose of education. At the level of social attributes, the moral relationship between teachers and students and AI, ethical codes, behavioral norms, and safety and security are key issues in thinking about the social attributes of technology[7]. Teachers need to have the knowledge of the social ethical risks caused by AI technology, such as "human rights ethics," "responsibility ethics," "environmental ethics," etc., as well as the contingency measures to comply with the operational norms of AI technology to minimize the ethical risks and negative impacts caused by the technology. Teachers need to comply with the rules and regulations on the operation of smart technologies to minimize the ethical risks and negative impacts caused by these technologies.

3.4 Role orientation in teacher development

In the process of integrating people and technology, the continuous progress of technology has put forward new challenges and requirements for teachers' professional development. Teachers need to face up to and actively utilize intelligent technology to assist their professional growth, and to be explorers of educational research and practitioners of lifelong learning.

3.4.1 Seeker of educational research

Sukhomlynsky said, "If teachers are to be able to enjoy themselves because of their work, and not to think that the daily lessons are just boring work, then we should take every teacher to the path of happiness in engaging in educational research." [8] Teachers who are good at thinking and summarizing in their teaching practice will be able to overcome and solve many difficulties and problems that arise in teaching. Whether in the past or present, in the age of artificial intelligence, teachers need to be a researcher or seeker in their teaching practice, to maintain sensitivity to

educational phenomena, to grasp the development and changes of the times, to utilize intelligent technology, to promote the combination of personal practice and educational theory, and to make themselves real expert teachers.

3.4.2 Practitioners of lifelong learning

The spread of the Internet and the wave of digitization have led to the emergence of a learning society, and lifelong learning is indispensable in this new era of increasingly fast-paced and ever-changing knowledge. Teachers should keep abreast of the requirements of the times, update their personal education concepts, and become proficient in the operation techniques of smart devices. At the same time, they should use smart technologies to expand their own fields of learning, find more learning opportunities, and become practitioners of lifelong learning. Only if teachers always insist on continuous learning will they be better able to set an example for cultivating students' lifelong learning ability.

4. Strategies for Teachers' Roles Orientation in the Age of Artificial Intelligence

4.1 Updating educational concepts and innovating teaching models

Concepts are the precursors of behavior, and different concepts determine different educational directions and behaviors. Teachers need to be proactive in assuming their roles in teaching and learning activities and constantly recognize their role positions. In the era of artificial intelligence, teachers updating their educational philosophy is a prerequisite for promoting educational change and developing high-quality education. First, teachers should take the initiative to understand and utilize intelligent technology, explore new teaching methods and strategies with creative thinking, receive new knowledge and ideas with an inclusive attitude, and carry out intelligent teaching with the support of intelligent technology. Secondly, teachers need to re-conceptualize the emerging teacher-student relationship. The age of artificial intelligence has shaken the monopoly of teachers in teaching, and the ways for students to acquire knowledge have become diversified and convenient. Therefore, teachers need to break the shackles of the original role, focusing on students' learning, adjusting the teaching content and innovating the teaching mode. Thirdly, teachers should have the teaching concept of human-machine synergy, moderately give way to repetitive and tedious work to intelligent machines, spend more time and energy on creative work, and give full play to the respective advantages of the two, so as to achieve the effect of $1+1>2$.

4.2 Enhancing research awareness and promoting professional development

The age of artificial intelligence has solved the dilemma of teachers being bogged down in tedious tasks, and with the support of smart devices, teachers are able to free themselves from the basic tasks of the past to engage in more creative work, making the "teacher as a researcher" a reality. Teachers should enhance their awareness of research, play their own role in research, reflect systematically on educational problems and phenomena, and form professional theories to help their professional growth. In addition, intelligent machines record a large number of students' learning and activities, and these massive first-hand data not only provide good practical support for the research work of the teaching team, but also facilitate the further innovation of teachers' research theories driven by data. Teachers should combine teaching activities with teaching research to innovate and enrich education and teaching theories, so as to promote their professional development and become innovators of education theories.

4.3 Enhancing professionalism and conducting self-education

Changing times and technological advances have placed new demands on teachers' professional literacy, and teachers must develop new literacies based on their previous literacies to meet the challenges of the AI era. First, teachers need to be equipped with information technology literacy to improve their ability to collect, integrate, analyze, process and apply information, to promote the integration of technology into education and teaching, and to provide students with high-quality and creative education. Secondly, teachers should be equipped with humanistic qualities to serve the cultivation of well-rounded and complete human beings, to guide students to explore the value and meaning of life and to pursue the essence of education. Thirdly, teachers should have competence qualities, including instructional design ability, innovation ability, management ability, etc., and utilize artificial intelligence, virtual reality and other technologies to enrich the learning environment and resources for students, and provide scientific decision-making for students' development.

5. Conclusions

To conclude, the rapid development of artificial intelligence has put forward new requirements and challenges for teachers, whose role cannot be limited to imparting knowledge, but lies more in guiding, motivating, and awakening students in a learner-centered manner. Teachers should explore their own development potential, improve their professionalism, actively adapt to the role change, and cultivate the intelligent talents needed by the society under the guidance of the concept of human-centered education.

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