

Teachers' role orientation and practice roadmap in the context of digital transformation of education

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Abstract: Under the dual drive of policy guidance and digital technology development, the digital transformation of education has become the focus of the education game of big countries. The deep integration of new technology and education is the primary demand of education modernization. In order to better fulfill the mission of teaching and educating people in the context of digital transformation of education, teachers should break through the shackles of traditional roles and take the initiative to respond to the opportunities and challenges brought by digital technology to education and become the supporter of personalized learning for students, the initiator of collaborative development of people and technology, the awakener of teachers and students to grow their lives together, and the practitioner of lifelong learning. In order to help teachers adapt to the role changes triggered by the digital transformation of education, it is proposed that teachers should, based on insisting that the origin of education is to educate people, take the initiative to construct their digital literacy, coordinate and integrate all kinds of educational resources, and rationally understand the relationship between technology and human beings, starting from teachers' behaviors.

1. Introduction

Under the tide of the development of the times, the digital transformation of education has become an irreversible trend, and human-technology synergy is the new form of education in digitalization. Teachers need to be prepared in advance for the future high-speed development of the work environment, to adjust the image of the traditional education system of the industrial society in the past, and to try to find their role and master new skills to meet the market demand (Fu and Lu, 2023)[1]. In the digital era, new technologies such as artificial intelligence are replacing the teaching profession's traditional needs in teaching, learning, testing, evaluation, and management. Based on this, this study will start from the challenges of AI and other new technologies to teachers' roles, integrate the rationality of technology development with the humanistic concern of education, clarify the division of roles of teachers in the new education ecology, and alleviate teachers' technological anxiety while enabling technology to empower the digital transformation of education accurately.

2. Digital transformation of education and the role of teachers

The substantial rise of the digital economy has promoted the high-quality development of digital technology, and the focus of the education game of the big countries has provided a new point of view and focus for the innovation of the education system. Clarifying what digital transformation of education is is a prerequisite for transforming teachers' roles.

2.1. Conceptual Definition

Digital transformation of education is not only a mere application of technology but also a comprehensive educational change, aiming to improve the quality, efficiency, and universality of education and promote the overall development of students and social progress. The digital transformation of education is based on data elements, coordinating the elements of education and teaching in physical and digital space, realizing the deep optimization and integration of the whole process of educating people, updating the concept of education based on digital space, constructing a new paradigm of education and teaching, and establishing a new system of education and teaching. In general, the digital transformation of education is essentially the embedding and coupling of digital technology in education.

Teacher role refers to teachers' multi-dimensional and multi-functional identities and responsibilities in education that align with social requirements. Mead pointed out that role is a behavioral pattern linked to a particular social position, and people in what position will play what kind of role and then show a behavioral pattern that is compatible with the position. Moreover, the corresponding behavioral pattern must be transformed when the role needs to be transformed. If the conversion cannot be carried out effectively, the individual will fall into the dilemma of role change or even exit the new role. The definition of teacher roles continues to evolve with the development of educational concepts and technologies. This is the case for teachers in the digital transformation of education, where the rapid development of artificial intelligence, learning analytics, and robotics is changing how teachers and students teach and learn. Teachers need to redefine their roles on a theoretical level. Suppose teachers cannot correctly perceive their roles and effectively transform them in this process. In that case, they will encounter a role crisis, leading to ineffective digital learning for students.

2.2. The Value of Teacher Roles in the Digital Transformation of Education

Artificial intelligence, robotics, and blockchain are poised to change the way we teach, learn, and run schools. A new education ecosystem is being generated, and the role positioning of teachers in the industrial era can no longer fully adapt to the development of the times. Repositioning the role of teachers in the digital era obviously has multiple values.

First, grasp the future aspects of educational change and promote the digital transformation of education. The rapid development of artificial intelligence, learning analytics, and robotics is changing how teachers and students teach and learn. Transforming the role of teachers is crucial to grasping the future changes in education and promoting the digital transformation of education. This change not only gives teachers broader responsibilities but is also the driving force and direction for the renewal of the education system.

Second, it responds to the digital transformation trend of education and builds a new platform for cultivating the talents needed. The changing role of teachers encourages the sharing and collaboration of educational resources. Teachers are no longer isolated educators but work with peers, students, parents, and educational institutions to share resources and experiences. This shift is not just a change in teaching methods but also a way to create a learning environment and platform

for students more relevant to the digital age.

Third, it is a new impetus for teacher development to meet the challenges of the digital transformation of education. The transformation of teachers' roles promotes their professional growth and self-improvement. In the face of digital transformation, teachers continue to learn, explore, and adapt to new technologies and methods, injecting new impetus to improve their teaching level and professionalism.

3. Positioning of teachers' roles in the digital transformation of education

Standing at the moment of transition from the industrial era to the digital era, people's aspirations for a better future and the ever-changing technological advances quietly transform the expectations of teachers' roles. The penetration and application of digital technology in education is a double-edged sword for teachers; on the one hand, it can better fulfill the mission of teaching and educating people; on the other hand, the digital transformation of education has increased much uncertainty, and teachers are more than ever faced with "the confusion of reality and the reality of confusion." It is true that the extreme statement of "the theory of teachers' extinction" will not happen in the foreseeable future. However, teachers face the cruel reality that those who actively adapt to technological development will replace those who stick to the tradition. Teachers in the new environment must reshape their roles to fulfill their mission of teaching better and educating people in the new era.

3.1. Nurturing People: Benchmarking the Role of Teachers in the Digital Transformation of Education

In the context of the digital transformation of education, teachers are the stalwarts of the mission of moral education. The role of teachers is a time-honored topic, and the role of teachers changes with the social scene. However, teaching has always been the mission of teachers from ancient times to the present. From the perspective of the logic of practical value of the historical evolution of the role of teachers, it has always followed the thread of teaching people to survive, teaching people knowledge, and teaching people to seek knowledge (Luo and Jin, 2020)[2]. Teachers must transmit human knowledge, wisdom, and culture. They also need generous and noble virtues to fulfil the mission of awakening lives, nurturing people, and shaping souls. Although the role of teachers has constantly adapted with the development of society, the duty of teachers to teach and educate people has always continued.

In this view, the benchmark for teachers' role positioning in the digital transformation of education remains to be teaching and educating people. It is clear that the origin of education is to educate people; the generation and perfection of human beings are the essential starting point of education, and the development of human beings is the primary yardstick to measure the value of education (Jin, 2023)[3]. To realize teachers' mission of teaching and educating people better in the digital age and avoid going astray towards "technology-based," we must remember that teachers are the persistent guardians of moral education.

3.2. Changing with the times: Reshaping the role of teachers in the digital transformation of education

In the context of the digital transformation of education, new technologies such as artificial intelligence are influencing various elements of education, and the role of teachers in the industrial era can no longer meet the needs of the times. Then, what kind of role should teachers in the digital era take to fulfill the mission of teaching and educating people? From the relational dimension, the

author discusses that teachers in the context of digital transformation of education should be the supporters of students' personalized learning, the thinkers of the synergistic development of people and technology, the awakener of teachers and students' life growth, and the lifelong learner who seeks knowledge and explores new ideas (Qin and Zhang, 2020)[4].

3.2.1. Supporters of personalized learning for students

Personalized learning is not the same as individualized learning; personalized learning refers to the collective learning system in the classroom under the system of instruction according to the needs and interests of students and then set up classes, which is based on the premise of respecting the individual differences of students, and based on the different interests, motivations, needs, interests of each student, and ultimately to achieve the overall development of students in morality, intelligence, physical fitness and aesthetics as the ultimate goal of the paradigm of learning. Personalized learning does not appear out of nowhere but is needed in developing education. Ancient Greek education advocated "knowledge for free people" of liberal arts education pioneered the teaching of no fixed place in the teaching practice based on the age of the students to choose the appropriate educational content; in China, from the pre-Qin period, the "Records of the Learning" recorded that "teaching is also, to grow good and save its loss also In China, from the "Records of Learning" in the pre-Qin period to the "teaching is to grow good and save the lost" in the Spring and Autumn period, Confucius advocated the "teaching according to the ability of the students," all of which shows the importance of personalized growth of students. However, due to factors such as the size of our population, educational resources, and technological development, it is difficult for students to learn personalized learning (Zou et al., 2021)[5]. Teachers are only the transmitters of classroom teaching, and students generally accept prescribed curricula. Teachers have not yet played a corresponding role in determining "what is suitable for learning," "what depth of learning is suitable for," and "what learning styles are suitable for" each student. "Teachers have yet to play their role accordingly. In the context of the digital transformation of education, teachers need to become supporters of students' personalized learning by using artificial intelligence to detect, track, and diagnose students' learning under new circumstances so that each student can enjoy the opportunity to excel in life.

3.2.2. Proactive players in the development of human-technology synergies

"As a practical activity, technology is as old as mankind itself." In the history of human scientific and technological development, it is precisely because of the conflict and collision between the two that scientific and technological development has embarked on the "right path" to promote the development of human society. In the context of the digital transformation of education, teachers have been positioned as the initiative of human-technology synergistic development, which promotes closer interaction between teachers, technology, and students and promotes the innovation and progress of education (Guo and Wang, 2022)[6]. This role change is not only to adapt to the needs of the new era but also to lead the future development of education better. For one thing, digital transformation empowers teachers to interact and integrate with technology deeply. Teachers need to continuously learn, explore, and master new technologies and integrate them into their teaching practices to enhance the quality and effectiveness of teaching. Teachers can better meet students' needs through various education technology tools, achieve a more personalized and diversified teaching approach, and promote students' learning and development. Second, the digital transformation of education has given rise to a new model of collaborative human-technology development. Teachers are no longer individuals working alone but synergists working closely with technology. Through interaction with technological tools, software, and platforms, teachers can

monitor students' learning progress more effectively, personalize guidance, and adjust teaching strategies more timely to better meet students' learning needs. As a result, teachers who are part of the digital transformation of education are more autonomous and reflective. They are not only users of technology but also shapers and innovators of technology. Through continuous learning, practice, and reflection, teachers can better utilize technological tools to drive progress and change in educational practice.

3.2.3. The awakening of teachers and students to grow together in life

The digital transformation of education is a crucial point to respond to how to comply with the requirements of the times, the physical space of the teaching behavior in the data space to expand and extend; this expansion and extension of the original teaching order can not produce a significant impact, but also to ensure that the relevant responsibility for the main body of the role in the two spaces, the function of the consistency of the role of each teacher, director, administrators to play a role in the two spaces at the same time. Teachers and students are the two main subjects in education and teaching activities. Traditionally, the interaction between teachers and students is mainly limited to knowledge transfer in the classroom. The introduction of digital technology has broken this boundary, and teachers can interact with students in a broader scope, not only in the classroom but also through online platforms, social media, and other avenues. Such interactions are not only limited to knowledge transfer but also to emotional support, personal guidance, and care for the overall development of students. The teacher-student relationship is no longer a single "I-Thou" relationship but a shift towards the three dimensions of "person-person," "person-technology-person," and "person-technology." Instead, it has shifted to the three dimensions of "human-human," "human-technology-human," and "human-technology." In addition, digital technologies have made education more interactive and participatory. Teachers are no longer the subject of one-way knowledge transfer but partners in exploring and learning with students. In the process, the teacher can continuously draw on students' ideas, perspectives, and insights, which in turn can contribute to his or her growth and progress.

Most importantly, the digital transformation of education deepens the trust and connection between teachers and students. As role models for students, teachers set a positive learning example for students through their own continuous learning and growth. Such shared growth and mutual enlightenment build a deeper emotional bond between teachers and students. Therefore, in the context of the digital transformation of education, teachers are no longer mere transmitters of knowledge but partners who grow with their students. In teaching, guiding, caring, and inspiring students, they perform the growth and development of life together with students. As the awakeners of teachers' and students' life co-growth, teachers are shaping a deeper educational relationship and future educational model and values.

3.2.4. Practitioners of lifelong learning

The digital transformation of education has given rise to unprecedented changes, pushing the field of education to a whole new stage of development. Amid this change, teachers can only cope with the changes by possessing lifelong learning abilities. For one thing, digital transformation has given rise to brand-new teaching methods and tools. From online education platforms to interactive learning applications, the rapid development of educational technology has changed the traditional classroom model. Teachers need to learn and master these new technologies to create a more engaging and effective teaching and learning environment. This includes, but is not limited to, proficiency in instructional software, understanding the principles of online course design, and the ability to guide students in effectively using Internet resources. Second, digital transformation has

spawned continuous updates in educational content and curricula. As knowledge continues to expand and social needs change, course content evolves. As educators, teachers must keep abreast of the times and continue to learn the latest subject knowledge and teaching methods to provide students with the latest and best-quality educational resources and information. The digital transformation of education also empowers teachers with more independent learning opportunities. The richness and diversity of online learning platforms, professional development courses, and digital resources provide teachers with flexible learning options. This capacity for self-directed learning enables teachers to be self-driven to improve their professionalism and teaching ability continuously. Therefore, in the digital transformation of education, teachers are no longer limited to teaching what they already know but play the role of lifelong learners.

4. The Practical Path of Teachers' Adaptation to Role Transformation

In the new historical orientation and coordinates of China's development, teachers in the digital era must not be bystanders in the change of education and teaching but thinkers and actors who actively and proactively embrace technological innovation. Teachers in the daily teaching practice to promote the digital transformation of education should be self-aware of the integration of various types of educational resources, the use of technology wisdom to create, and then realize the integration of people and technology symbiosis of the new pattern of education.

4.1. Self-regulation: proactively constructing one's digital literacy

Teachers' digital literacy refers to the digital skills, knowledge, and attitudes that educators must possess to cope effectively with the challenges in the modern educational environment. Teachers' digital literacy is a critical factor in improving the quality of education and a necessary condition to help students adapt to the digital world. Constructing teachers' digital literacy first requires a change in teachers' concepts. Teachers actively apply digital tools and technologies in their teaching practice, try to use educational technology tools, such as online learning platforms and interactive teaching software, and improve their application skills through practice. For example, digital literacy can be enhanced through continuous self-learning and professional development. Through continuous exposure to new technologies, software, and platforms, teachers can better understand how digital teaching tools are used and how they can be integrated into teaching practice. Secondly, teachers can collaborate and share experiences with colleagues or join professional communities and online forums to communicate with other educators and explore best practices in digital teaching and learning. Such collaboration and exchanges can help to obtain practical advice, solve problems, and foster shared growth. In addition, reflection and self-assessment are essential ways to enhance digital literacy (Zhao et al., 2023)[7]. Teachers can continuously reflect on their teaching practices, think about the effectiveness of using digital tools, and make adjustments based on student feedback and effectiveness. Teachers can identify their strengths and weaknesses through this self-assessment and target improvements and enhancements. Finally, teachers should encourage themselves to remain open-minded and willing to experiment with new teaching tools and methods. Although digital teaching and learning may pose challenges, the courage to experiment and adapt to new technologies will help to enhance digital literacy. Continuous exploration, practice, and reflection are critical for teachers to improve their literacy in the digital era.

4.2. Integration and Symbiosis: Coordinating and Integrating Various Educational Resources

Digital technology will have a significant impact on educational application scenarios such as teaching, learning, management, examination, evaluation, and research. Teachers should have a

sense of active learning, master the advantages of digital technology, and explore how people and technology can be better integrated to serve education and teaching better. Coordinating educational resources in daily teaching practice is essential to educational quality and student development. For one thing, teachers are clear that the premise of educational symbiosis is to create a more flexible, diversified, and interactive learning environment so that students can better adapt to the changes in today's society and develop their innovative and lifelong learning abilities. Teachers, therefore, need to gain a deeper understanding of students' diversity and individual differences in their daily teaching practice and respond to the needs of different students in a personalized manner. This includes adopting diverse teaching methods and strategies, such as student-centered teaching, cooperative group learning, and project-driven learning, to meet different students' learning styles and needs. Secondly, teachers need to understand that integration is not simply a replacement for traditional teaching but rather a combination of the advantages of digitization while retaining the traditional strengths to bring new possibilities and advances to education. Overall, teachers should pay continuous attention to student's needs in their daily practice, actively cooperate with external resources, continuously improve their teaching ability, as well as reasonably integrate and utilize all kinds of educational resources to provide students with more prosperous and more diversified learning experiences and promote students' all-round development.

4.3. Brilliant Creation: Rational Understanding of Technology and People

Teachers should give full play to their human initiative and clarify that wisdom creation is not only a means for teachers to change their roles but also an effective way to cope with digital transformation. Teachers' wisdom creation practice lies in using digital tools and innovative teaching modes, personalized guidance of student learning, promotion of interdisciplinary cooperation, encouragement of student participation and interaction, and the continuous pursuit of professional development and improvement of teaching methods. This practice will provide students with more prosperous and innovative learning experiences while promoting education toward greater openness and diversity. As active agents in developing human-technology synergy, teachers promote innovation in the educational scene. They can combine technology with humanistic concerns, utilize creativity and imagination, and design more inspiring and innovative teaching methods. This innovation is not limited to changes in course content and teaching methods but is also reflected in the continuous exploration and innovation in teachers' teaching attitudes and methodologies. Teachers can integrate technology into their teaching in a variety of ways. For example, they can use the Internet and online resources to enrich the classroom content so that students can be exposed to a broader range of knowledge and information; teachers can use educational technology tools to personalize teaching and tailor the teaching content according to the needs and levels of students, helping each student to learn better; teachers can also utilize online platforms and social media to promote collaboration and communication among students, creating a more interactive and engaging learning environment. However, technology is not everything. Teachers cannot change their position as creators and users of technology. They need to be able to understand and utilize technology, as well as possess educational expertise and experience. Teachers should be able to strike a balance between technology and education and grasp the combination of technology and traditional teaching and learning to optimize students' learning and development.

5. Conclusion

Every social form's emergence, existence, and development is accompanied by the disappearance of old social roles and the birth of new social roles, so the flux of social forms will inevitably lead

to a social role crisis. In the context of the digital transformation of education, the rapid development of artificial intelligence, learning analytics, robotics, and other technologies is changing how teachers and students teach and learn. Therefore, teachers must continuously adjust their roles by adhering to the principle of educating people, highlighting their care for students' lives, and meeting the needs of teachers' endogenous development. Teachers are the cornerstone of the country's wealth, national revitalization, and people's happiness, and the transformation of teachers' roles in the era of digital intelligence should also receive the joint attention and support of multiple subjects.

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