



Transmutation and Action Path of Teachers' Role in the Educational Metaverse——A Perspective on the Theory of Social Role

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Abstract. The education metaverse will place new demands on teachers. How teachers will reshape their roles in order to proactively meet the educational metaverse has become a key proposition that needs to be addressed when looking into the future of teacher development. Based on social role theory, this article explored the intra-role, inter-role and extra-role conflicts arising from teachers' orientation towards students, resources and technology respectively, and analyses the scope of teachers' role reinvention in the education metaverse: from teaching and solving problems to being an emotional and nurturing facilitator, from being a provider of knowledge resources to being a designer of knowledge scenarios, and from being a user of technology to being a collaborator of multiple technologies. The study found that only by adhering to the nurturing role of education and exploring its irreplaceability can teachers continue to be self-liberating while maintaining the dynamics of education.

Keywords: education metaverse; social role theory; teacher role; role reinvention

1 Introduction

The education metaverse creates digital identities for teachers, students and administrators, allowing them to develop formal and informal teaching and learning spaces and interact in a virtual world¹. It has the potential to change the current shape of education and teaching. However, regardless of the form of education and teaching, the teacher is the most crucial factor in achieving the desired results². The teacher is the most critical factor in achieving the desired outcomes.

With the advancement of information technology and digitalisation, the environment in which teachers teach is changing dramatically, and the role of teachers is also changing. There are studies that suggest what challenges teachers will face in the education metaverse and how they will respond to them³. However, there has been no theoretical analysis of why and how teachers' roles will change in the context of the education metaverse. In view of this, an analysis of the crises teachers will face in the future ed-

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education metaverse from the perspective of their roles will help teachers to clarify their roles and respond to the demands of the times.

2 From teaching and solving problems to emotional nurturing ferryman

2.1 Learner-oriented: intra-role conflict

There are two main types of intra-role conflict: the conflict between the individual's perception of the ideal role and the actual role behaviour, and the conflict between the old and the new role when the individual changes roles⁴. Since ancient times, teachers have played the role of 'preaching, teaching and solving problems'. However, with the industrial revolution, the scale of education and the use of technology has degraded the role of teachers as 'preachers' and reduced them to the role of single-minded teachers.

The education metaverse frees teachers from basic, repetitive activities and uses virtual avatars to answer questions and solve problems for learners or to "teach in disguise"⁵. The metaverse of education frees teachers from basic, repetitive activities. Thus, teachers who continue to value themselves as merely teaching and solving problems will be in conflict with their actual role in it.

The advent of the education metaverse may reduce the load of teachers, but one of their jobs does not disappear, namely the role of the teacher as a preacher.

2.2 The objective value of moving from being a teacher to an emotionally nurturing ferryman

As an emotional nurturing ferryman to give teaching nurturing sentiment.

In the education metaverse, the role of the teacher in delivering repetitive lessons will be partially 'offloaded' to the virtual teacher. Real teachers may become overly reliant on virtual teachers, which will dilute the teacher's pedagogical ethos⁵.

The complex and dynamic nature of the students who are the subject of education dictates that the process of delivering education is highly variable. That cannot be achieved through pre-defined virtual teachers such as intelligent technology. The education metaverse allows teachers and students to interact physically through wearable devices, communicating and interacting with each other as if they were in the real world with the addition of 1:1 oriented replica objects. Their facial expressions and behavioural movements are mapped onto their virtual bodies. Teachers gain insight into students' inner feelings based on their facial expressions and voice intonation, guiding their psychologically healthy growth with empathy that avatars do not possess.

Avoiding the alienation of personality and the dissolution of real human relationships by indulging in virtual worlds.

With access to multiple sensory stimuli, real identities and real interactions between people will be permeated by the virtual, creating a crisis of personality alienation and the dissolution of real human relationships, which will pose a huge challenge to

students' worldview and outlook on life. Students are free to edit virtual images or avatars, and the anonymity and virtual nature will create barriers to self-identity for learners. Inevitably, students are confused between virtual and real interactions when faced with multidimensional interactions. This is especially true when students are addicted to virtual interactions for long periods of time in order to escape from reality, which can lead to virtual social vulnerability. Therefore, teachers need to guide students to manage the relationship between the virtual and the real so that they do not become addicted to the virtual and are unable to cope with the demands of the real world.

2.3 The way to move from being a teacher to being a ferryman of emotional education

Facing role expectations and adhering to the fundamental task of establishing moral education.

Role expectations are the expectations of individuals or society that individuals should take responsibility. The requirements of society for students determine what role society expects teachers to assume.

In this new education environment, teachers need to clarify the relationship between education and the Metaverse, always uphold the sentiment of "teaching and educating". Firstly, teachers should gain a deeper understanding of the functions and values of the education metaverse, which itself can be used as a new teaching field to compensate for the shortcomings of real education. Secondly, in a field where emotional education is easily absent, teachers and students should form a close emotional community. When teachers and students form an emotional community based on shared values and deep interaction, teachers can genuinely feel the inner needs of students, and students will become more emotionally dependent on teachers.

Change the concept of role and carry out a vivid and dynamic teaching design.

Faced with the expectation of a moral role, teachers need to change their traditional roles and use their extensive experience and theoretical knowledge to explore the path of 'preaching' in order to facilitate a smooth transition.

It is precisely the education metaverse that supports teachers and students to include the body in teaching and learning contexts and to stimulate embodied cognition in students. On top of this, teachers need to carefully design the bridge between the virtual and the real, otherwise blended learning will degenerate into a copy of the traditional classroom, just as it did during the epidemic. However, teachers should selectively design the ratio of virtual to real teaching content according to the content, the time and space in which students live, and the students' grasp of virtual and reality. Design thinking is an important literacy in the process of professional development of teachers in the age of intelligence⁶.

3 Moving from knowledge resource provider to knowledge scenario designer

3.1 Resource-oriented: inter-role conflict

Inter-role conflict refers to the conflict that occurs between the different roles that individuals take on. The availability and quality of resources has a significant impact on the quality of teaching and learning, which is assured when learners have high quality teaching and learning resources⁷. The virtual and real knowledge resources distributed in the education metaverse require teachers to design a blend of the two, making it a challenge for teachers to take on the role of combining virtual and real resources as opposed to the single real resources provided by traditional education or virtual resources in virtual reality.

On the other hand, the dimensionality of educational resources in the education metaverse has been expanded to three dimensions. In addition to two-dimensional text and video, there are also three-dimensional virtual resources in the form of scenes and three-dimensional scenarios, i.e. scenarios of knowledge resources. Teachers will therefore gradually move from being providers of knowledge resources to being designers of knowledge scenarios. When teachers are responsible for both the output of high quality knowledge resources and the design of knowledge scenarios, there may be a conflict of roles due to the lack of time for both.

3.2 A logical progression from knowledge resource provider to knowledge scenario designer

The decentralised nature of knowledge resources.

In the education metaverse, not only can knowledge resources flow smoothly, but even knowledge resources generated in the virtual and real world can be connected to each other. With the Learning Data Cloud, the Learning Resources Cloud and the Learning Services Cloud, data can be seamlessly transformed and connected from top to bottom⁸. The teacher's role as a provider of knowledge resources will gradually diminish and become an exporter of quality knowledge resources, so that learners who are not in the same space and time can access knowledge resources for knowledge processing and construction.

Knowledge-like scenarios.

The education metaverse uses computer graphics technology to restore the reality of teaching and learning to the virtual world in a highly consistent manner or to present students with scenarios across time and space. Knowledge patterns are transformed from flat and three-dimensional to scenarios that enrich students' access to different representations of knowledge. With expanded reality, students use avatars to gain authentic learning experiences whether in virtual or realistic scenarios, and the multichannel encoding of visual, auditory and tactile information helps learners to internalise the acquired information. Thus, when teachers are faced with new representations of

knowledge, they need to design scenario-based knowledge resources without completely abandoning traditional ways of presenting knowledge.

3.3 The path from knowledge resource provider to knowledge scenario designer

avoiding character disorientation and digging into content suitable for knowledge scenarios.

Teachers are faced with an education metaverse that includes both virtual learning resources, physical resources and digital resources, which can be a 'sea of resources' for teachers with limited time and energy to navigate⁹. They are required to sift through the vast amount of resources to find quality knowledge resources, taking into account the cognitive characteristics and needs of students, and to design knowledge content that is appropriate to the context. For the education metaverse, scenario-based knowledge can be classified as the middle level of the Dyer's Tower of Experience, while scenario-based knowledge resources can be manipulated, interacted with and given feedback by students, thus gaining the experience of 'doing'.

The other scenario-based element is the linking of lived, meaningful knowledge scenarios from students' existing experiences, through which the learning content is bridged to the students' context, allowing them to discover the tacit knowledge of their culture and the outside world in a lived scenario. The teacher's role is to tap into the knowledge in the lived scenarios that can be connected to the students and designed for scenarios.

alleviate role overload and develop a shared concept of teacher and student co-creation.

Role overload is a paradoxical situation that occurs when expected of a role than the role can handle, and there is not enough time and energy to balance tasks¹⁰. In an education metaverse where knowledge is being updated and iterated at an accelerated rate, it is a burden for teachers to take on the screening of knowledge resources and the design of knowledge scenario-based content. The virtual learning resources and learning environments in the metaverse are not fixed and can be modified and remodelled by the learners¹¹.

Firstly, teachers should become the 'knowledge media' of students in the education metaverse, acting as a channel and intermediary for the transmission and acquisition of knowledge¹². Students can also create and adapt existing knowledge resources to generate new ones. The increased participation of students will motivate them to become producers of knowledge and foster their creativity.

Secondly, teachers and students can form a community of co-creation and co-learning in the process of designing knowledge scenarios together. Students could design life-like knowledge scenarios based on their context. By combining the two, not only can the knowledge content be linked to life, but they can also learn and collaborate together to achieve teaching and learning.

4 Moving from technology user to multiple technology collaborator

4.1 Technology-oriented: extra-role conflicts

Extra-role conflict is a conflict that occurs between two or more role-players and takes the form, among other things, of a lack of common understanding of a particular role by occupants of different role positions⁴. In the education metaverse, forming real teachers, avatar teachers, virtual teachers, etc. serving one student, i.e. a many-to-one concentration.

However, virtual teachers, robots and intelligent learning companions will take their place in the education metaverse, creating a sense of role squeeze for teachers. The teacher's original role of teaching and learning and providing knowledge resources will be partially transferred to the technology, and the roles played by the teacher and the technology will not be aligned or the division of labour in the whole process of teaching will be inappropriate or blurred, resulting in extra-role conflict between the teacher and the intelligent technology, leading to role confusion for the teacher.

4.2 The trend of the times from technology users to multiple technology collaborators

From technology use to human-machine collaboration.

The advent of the artificial intelligence era has overturned the perception of technology as a mere tool for teachers, forcing them to move from being users of technology to a collaborative human-machine approach. Teachers, however, are often between the extremes of still using AI as a tool and giving up the main body of teaching to AI, unable to carry out reasonable human-computer collaboration. For one thing, educational subjects, forms, systems, services and governance are all undergoing the reshaping effects of AI to varying degrees¹³. While teachers' attitude towards AI is still at the stage of technology users, and human-computer collaboration is at a weak intelligence. Secondly, teachers have completely 'ceded' the role of education to AI. With the support of AI, the role of the teacher in technology-oriented education must still be clarified, so that human-computer collaboration can move towards a strong intelligence.

From human-machine collaboration to multi-technology collaboration.

Teachers in the education metaverse will additionally collaborate with humanoid technologies such as their avatars, students' avatars, as well as humanoid technologies such as brain-computer interface technologies and interaction technologies. The role of the teacher will move from human-machine collaboration to a role of collaboration with multiple technologies.

The education metaverse allows teachers and students to create their avatars, either using a 1:1 image of the avatar generated by digital twin and rendering technology, or freely creating and editing the avatar. The greatest advantage of using avatars is that teachers and students can learn out of time and space, and the addition of sensory

technology and whole-body interaction allows teachers and students to synchronise their teaching and learning with that of the real world in terms of sight, sound, touch and smell. With the use of avatars, the teacher's avatar can stealthily observe group activities to keep abreast of learning progress and difficulties, or open up a separate virtual seminar room to interact with learners on a one-to-one basis to answer questions and solve problems¹⁴.

Enhanced role-playing and increased coordination between the real body and the incarnation.

Role-playing refers to the behaviour of people according to their particular position and situation. Education metaverse provides a field in which they can role-play. With the stronger the role-playing ability the less time and effort required and the less role conflict generated, and the greater the opposite¹⁵. The education metaverse can simulate real-life teaching and learning scenarios, and teachers can use their avatars to teach their students' avatars in simulated educational sessions in virtual scenarios, exercising their ability to respond to teaching and developing their own teaching resourcefulness.

When teachers have limited time and energy, they may allow the avatars to take over the tasks they have set for themselves. The tracking of student progress, collection of assessment data, etc. can be replaced by an avatar. The relationship formed between the incarnation and the student is not the same as the teacher-student relationship formed between the teacher's real body and the student. The incarnation is ultimately technologically generated, which is embedded in the teacher-student interaction can only be subordinated to the teacher-student relationship, and cannot be 'reversed'¹⁶. Teachers need to define the distribution of tasks between the real and the avatar in their role-playing attempts, and to enhance the coordination between the real and the avatar.

Training role skills to enhance synergy between teachers and non-humanoid technology.

Role skills, which are the sum of personality traits for a person to practice their role¹⁷. Both the digital and information revolutions are transforming all sectors, and the education sector is probably the last to be transformed. The reason is that teachers are not yet equipped to collaborate with the products of educational technology.

Firstly, teachers need to perceive technology in a fundamentally rational way, not from the perspective of 'technological determinism' or 'technological uselessness', but from the practical perspective of education itself, ensuring that the subject and object are not reversed. The key to mitigating role conflict for teachers themselves is subjective effort¹⁸. Teachers should have a subjective inclination to engage in human-computer collaboration, to actively integrate technology into the whole of education, and to develop holistic values and literacies of human-computer collaboration.

Secondly, teachers need to receive professional skills training to improve their knowledge and proficiency in using the underlying technologies. Before the education Metaverse has arrived, they should exercise their practical skills. Virtual reality teaching can be used as a prototype of the education Metaverse. Teachers can first explore how to create virtual scenarios and design teaching strategies for virtual reality in order

to prepare for the design of educational scenarios that integrate reality and reality in the education Metaverse.

5 Conclusion

Although the education Metaverse has not yet arrived, gradually universities and enterprises are joining hands to create education Metaverse platforms, develop education Metaverse products, which will accelerate the implementation of the education metaverse. Therefore, teachers should be aware of the role change and update their educational expertise in the present. In the future, we can try to build an education system and teacher training standards for teachers in the education metaverse era from the education metaverse ecosystem.

Reference

1. Hua Zixun, Huang Muxiong. Teaching field architecture, key technologies and experimental research of education metaverse[J]. *Modern Distance Education Research*,2021,33(06):23-31.
2. Tian Aili. Teacher role transformation and comprehensive literacy enhancement under the flipped classroom teaching model [J]. *Teacher Education Research*, 2015, (5).
3. Xu Jian, Wang Jun, Zhong Zheng, Zhang Guoliang, Feng Sijia. Challenges and responses of teacher development in the era of education metaverse[J]. *Open Education Research*,2022,28(03):51-56.DOI:10.13966/j.cnki.kfjyyj.2022.03.005.
4. Sociology [M]. Higher Education Press , Wu Duo, 2011
5. Xu Jian, Wang Jun, Zhong Zheng, Zhang Guoliang, Feng Sijia. Challenges and responses of teacher development in the era of educational metaverse[J]. *Open Education Research*,2022,28(03):51-56.DOI:10.13966/j.cnki.kfjyyj.2022.03.005.
6. Zhang, Rongfei, Tian, Liangchen, Ma, Zhiqiang. 2022. Design thinking cultivation of teachers in the age of intelligence: logical directions and dilemma relief [J]. *Chinese Distance Education* (4): 55-64.
7. Fu Yiyang, Yuan Yiming, Guo Yiruo, Guo Yajun. Teaching support service model of university libraries in the metaverse perspective[J/OL]. *Library Forum*:1-9 [2023-01-14]. <http://kns.cnki.net/kcms/detail/44.1306.G2.20220804.1429.002.html>
8. Liu Geping, Wang Xing, Gao Nan, Hu Hanlin. From virtual reality to metaverse: new directions for online education[J]. *Modern Distance Education Research*,2021,33(06):12-22.
9. Guo Shengnan, Wu Yonghe. Teachers in the age of artificial intelligence in the context of social role theory: predicament, attribution and clarification[J]. *Research in Electro-Chemical Education*,2022,43(06):18-24+60.DOI:10.13811/j.cnki.eer.2022.06.003.
10. Fan Huiming. Role theory: an analytical framework for the role of teachers in industry-university collaboration[J]. *Explorations in Higher Education*,2021,No.218(06):34-39.
11. Lan Guoshuai, Wei Jiazai, Huang Chunyu, Zhang Yi, He Yuting, Zhao Xiaoli. Learning metaverse empowers education: constructing a new model of "smart+" educational applications[J]. *Journal of Distance Education*,2022,40(02):35-44.DOI:10.15881/j.cnki.cn33-1304/g4.2022.02.003.

12. Wang Weimin. Study on the expansion and deepening of library services in the new media environment[J]. Librarianship,2013(17):87-90.DOI:10.15941/j.cnki.issn1001-0424.2013.17.021.
13. Cao Peijie. The Triple Realm of Artificial Intelligence Educational Change[J]. Educational Research,2020,41(02):143-150.
14. ZHONG Zheng,WANG Jun,WU Bei,ZHU Sha,JIN Shuaizhen. Exploring the application potential and typical scenarios of educational metaverse[J]. Open Education Research,2022,28(01):17-23.DOI:10.13966/j.cnki.kfjyyj.2022.01.002.
15. Jenny J. Lee and Robert A. Rhoads. Faculty Entrepreneurialism and the Challenge to Undergraduate Education at Research Universities[J]. Research in Higher Education, 2004, 45(7) : 739-760.
16. Tang Yuxi, He Weiguang. Why teachers exist in the age of artificial intelligence: regulations, dilemmas and beyond[J]. Chinese Distance Education,2022,No.573(10):21-28+39+76.DOI:10.13541/j.cnki.chinade.2022.10.002.
17. Xi Congqing. Research on role theory [M]. Hangzhou: Hangzhou University Press, 1991.
18. Dong Zefang. Conflicting roles of teachers in the period of social transition[J]. Journal of Huazhong Normal University (Philosophy and Social Science Edition), 1996(06):44-50+58.

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