

Exploring the Path of Teacher Dominance in the Age of Artificial Intelligence

Rui Li and Dan Fu*

Department of Pedagogy, Faculty of Education, Yunnan Minzu University, Kunming, China
Email: 1367303073@qq.com (R.L.); 34160551@qq.com (D.F.)

*Corresponding author

Abstract—The development of Artificial Intelligence (AI) has had a profound impact on all aspects of human society. The digital transformation and upgrading of artificial intelligence have promoted profound changes in the education system. As the leader of school education activities, teachers should actively play their leading role in the era of artificial intelligence. Based on the background of the era of artificial intelligence, starting from the dilemma faced by teachers' professional development in reality, the paper analyzes the path of teachers' leading role in the era of artificial intelligence, and proposes to adhere to man-machine collaboration and strengthen the cultivation of artificial intelligence literacy, strengthen teachers' subjectivity and show humanistic care, realize the role transformation and establish the educational concept of lifelong learning.

Keywords—Artificial Intelligence (AI), teachers, a dominant role, path

I. INTRODUCTION

Entering the era of artificial intelligence, the emergence of artificial intelligence machines has more profoundly changed the development of the field of education. Under the influence of new technology, the role of teachers in teaching has changed, from knowledge imparted to the instructor of students' learning activities, the designer of classroom teaching activities, and the manager of intelligent devices. In the era of artificial intelligence, teachers are adapting to the changes in the surrounding environment and roles, and the development of artificial intelligence machines is forcing teachers to seek a broader and more sustainable space for professional development. However, how to cooperate with machines and how to play the leading role of human teachers have become the core issues in the concrete practical scenes with many influencing factors. Therefore, based on the question of how teachers play their leading role in the era of artificial intelligence with the participation of machines, this study explores the path for teachers to play their leading role in the era of artificial intelligence from the dilemma faced by teachers in the era of intelligence.

II. LITERATURE REVIEW

A. Use of Artificial Intelligence in Education

The term artificial intelligence was first coined by John McCarthy in 1956 [1]. Baker and Smith [2] pointed out that artificial intelligence did not refer to a single technology, but was defined as “a computer that performs cognitive tasks, generally related to the human mind, especially learning and problem solving”. At present, technology products based on artificial intelligence technology have become very common in life, and human beings have initially entered the era of artificial intelligence. China's research on artificial intelligence has made great progress and is gradually applied to all aspects of life. For example, intelligent devices can connect “people” and “things”, and give commands to intelligent devices, so as to achieve mutual contact between people. In 2017, The State Council issued the “New Generation of Artificial Intelligence Development Plan” [3], and the guiding ideology and safeguard measures mentioned in the document have laid a solid foundation for accelerating the rapid development of artificial intelligence in China. In the era of artificial intelligence, earth-shaking changes have taken place both in social life and in education and teaching. The use of artificial intelligence to empower education is a major trend in the current development of education. Foreign scholars' application of artificial intelligence technology in the field of education mainly focuses on the application of artificial intelligence in teaching technology, the application of artificial intelligence to student cooperation, and personalized learning support. Chinese scholars have done a lot of research on the application of artificial intelligence technology in the field of education. Li, Yang, and Ming [4] proposed that artificial intelligence technology plays a positive role in the security of colleges and universities. Yang and Xue [5] proposed that intelligent teaching system, personalized learning, and educational robot are important applications of artificial intelligence in the field of education. Niu [6], after summarizing the application status of artificial intelligence in education, proposed that the support of intelligent learning process, intelligent campus, intelligent subject tools, intelligent robot learning partners and toys, and intelligent assistants for special education are all applications of artificial intelligence in education.

Artificial intelligence has entered a period of steady development since the 1990s, and the current application of artificial intelligence in education mainly has two aspects: one is to provide personalized services for students, such as intelligent teaching system can analyze students' performance in class, and then propose targeted teaching programs to help students learn better; The second is to provide technical support for teachers. For example, teachers can use smart classrooms to achieve high efficiency in classroom teaching. At present, Chinese colleges and universities are also vigorously cultivating compound talents to promote the adaptability of students in the future society. Different scholars' discussions on the application of artificial intelligence in the field of education can help people realize the advantages of the combination of traditional teaching methods and modern educational technology in the era of artificial intelligence.

B. Dilemmas Facing Teacher Dominance in the Age of Artificial Intelligence

In the current era of artificial intelligence, although the profession of teachers has not been completely replaced by machines, the various pressures and challenges brought by it have made the transformation of this profession more urgent.

1) The dilemma of teachers' role change

The wide application of artificial intelligence technology in the field of education has caused many difficulties in the construction of teacher identity. Zhao, Li, and Cao [7] analyzed four realistic dilemmas faced by the construction of teacher identity in China from the perspective of historical changes and the connotation of teacher identity construction: teachers' knowledge authority has been weakened; Teachers' shallow learning of knowledge is difficult to adapt to the challenges of the intelligent age. Teacher research suffers from data literacy bottleneck and emotional distance disorder; The training of teachers' information-based leadership is out of step with the development of intelligent education. Hu [8] proposed that in the era of intelligence, teachers are faced with technology replacing their own subjectivity; Efficient artificial intelligence replaces the role of "teacher"; Precise artificial intelligence enables teachers to "teach according to their aptitude". Liu and Liu [9] analyzed Heidegger from the perspective of his philosophy of technology and pointed out that in the era of artificial intelligence, the teacher's role is "unembedded" and "hidden" due to the loss of the teacher's subject. Because of the "only technical view", its role is "forced" and "ordered"; Due to the loss of humanity, its role is "digitized" and "unified".

2) The dilemma of educational technology ethics

With the improvement of the intelligent level of teaching means, it has a great impact on the professional development of teachers, but also brings challenges to teachers in aspects of technical anxiety, teaching method innovation, and development model complexity. With the development of science and technology, whether in the field of actual teaching or the field of traditional knowledge monopoly, it has a huge impact on teachers.

While the "displaced" jobs are to some extent predictable, after all, technology can stretch people to the limits of their abilities and enable them to perform tasks that are beyond their capabilities. But with the continuous development of artificial intelligence, artificial intelligence has become more than a tool to assist teaching, it can also have a greater impact on education and teaching. Du *et al.* [10] proposed that while artificial intelligence technology brings convenience, it also generates complex ethical, legal, and security issues. Liu *et al.* [11] have proposed to be vigilant against privacy ethical issues such as data leakage and data gap. At present, the application of artificial intelligence based on big data in China is still in a disorderly state, lack of constraints on the data security of Internet enterprises, and respect for user privacy information. This is a potential ethical risk for both teachers and students.

3) The dilemma brought about by "human-machine conflict"

In the era of artificial intelligence, teaching has undergone great changes, and the status and role of teachers are also changing. The dilemma faced by teachers reflects the reality of human-machine conflict in today's society. On the one hand, there is still no conclusion on how to apply intelligent technology to teachers' teaching in order to achieve maximum effectiveness. Teachers have insufficient understanding of intelligent technology, which makes intelligent technology unable to play its due role in education. On the other hand, since AI is not human, it is possible to make educational conclusions that some people cannot understand, and it is possible to disagree with people on education. Students are a complex composed of cognition, emotion, attitude, etc. Artificial intelligence is not omnipotent in educating students. If the dominant position of teachers is in an absolute disadvantage for a long time, artificial intelligence alone can not achieve educational goals. Even if one day artificial intelligence has autonomous consciousness and emotions, it does not mean that we do not need human teachers. Of course, with the development of science and technology, artificial intelligence is becoming more and more mature, the status of teachers will inevitably face impact, but at the same time, society's requirements for teachers will also become higher and higher. In any field, the competition between technology and talent is unavoidable. If you want to survive in this era, you must constantly update your knowledge and constantly update your technology so that you can keep up with the pace of The Times.

III. POSSIBLE PATH OF TEACHER'S DOMINANCE IN THE ERA OF ARTIFICIAL INTELLIGENCE

From the history of the development of educational discipline, the leading role of teachers in each period has its characteristics of The Times. Different times, social, economic environment, and scientific and technological levels, all affect the direction of the leading role of teachers. In the era of artificial intelligence, teachers are considered to be one of the most critical stakeholders in AI-based teaching [12]. Teachers' requirements for their

leading role are also increasing. In the era of artificial intelligence today, although the work of teachers has not been replaced by machines, the challenges and pressures brought by it also make teachers urgently transform to ensure that their dominant position will not be lost. Artificial intelligence is an important trend in the current development of education. Artificial intelligence can realize intelligent teaching and intelligent management, but it still cannot replace the leading role of teachers in education and teaching. The combination of artificial intelligence technology and teacher-led role can make educational activities more personalized, diversified, and information-based. If teachers want to guide the personality development of students well, be the “guide” of students’ growth, and play a leading role in education and teaching without being replaced by machines in the era of artificial intelligence, they can start from the above predicament faced by teachers, and explore the possible paths for teacher leadership:

A. Adhere to Man-Machine Collaboration and Strengthen the Cultivation of Artificial Intelligence Literacy

With the rapid integration of artificial intelligence technology and all aspects of society, the collaboration between humans and machines has become an important feature and development direction of today’s intelligent era. Man-machine cooperative teaching has initially formed a teaching model, which provides a new way to understand and construct the future education field. Man-machine cooperative education in learning essence is that people interact with the world and understand the world with the help of technology; In the form of learning, it is a process in which people and technology establish a cooperative relationship and develop cooperatively. The collaborative process is the interaction and cooperation of multiple agents, that is, the continuous transmission of information and mutual understanding between different agents. The result of synergy is to obtain a new order state, the ultimate goal of which cannot be realized by only one individual, but requires multiple individuals to work together to generate “new qualities” [13].

Teachers should cultivate their own data ability. As the direct users of new technology, teachers are also the main implementers of new technology, which plays a decisive role in the form and effect of education and teaching. They should actively adapt to the development of The Times and should not use new technology because of fear of new technology. The man-machine collaborative teaching mode has gradually formed a new teaching mode. Teachers should have the awareness, ability, and accomplishment of cooperating with artificial intelligence, and should not always engage in the work that machines are good at, but should use their own advantages to cooperate with machines. In educational practice, they should always be vigilant and reasonably handle the relationship between themselves and artificial intelligence to avoid becoming a technical “assistant”. For example, teachers can use the results of intelligent system diagnosis to provide a new basis for teachers’ educational decision-making, and the two can coexist with each other,

beyond the simple division of tasks [14]. Some teachers rely too much on smart technology. Although the decisions made by intelligent technology have the advantage of efficient science, artificial intelligence is, after all, just an established program, and it does not have human psychosocial attributes. In traditional education, teachers play the role of knowledge imparts. The emergence of artificial intelligence technology makes the way for students to acquire knowledge no longer limited to teachers and books, and the channels for students to acquire knowledge are more diversified and enriched. In the current era of artificial intelligence, the role of teachers is more like an expert in intelligent device management. The initiative and enthusiasm shown by teachers and students in the process of teaching and learning are unprecedented in traditional education, and the communication between teachers and students is more frequent. Teachers and students aim to grow together in class.

Teachers need to remain sensitive to AI technology. Clearly define their main position in education and teaching in the era of artificial intelligence, grasp the initiative of education, and do not blindly follow artificial intelligence decision-making. Artificial intelligence tends to solve structured problems, such as teacher homework grading, and for unstructured problems, such as the cultivation of students’ moral awareness, it often does not have perfect processing ability. In the process of rational analysis of the decision made by the machine, teachers should explore the problems such as too mechanization and emotional neglect in the decision making, so as to better bring out the human advantages of teachers’ decision making.

In the new situation of the application of artificial intelligence technology, how to improve the wisdom quality of teachers is a major issue facing the current education development. First of all, it is necessary to study the professional development of teachers based on students’ wisdom and accomplishment. It is necessary to clarify the current research status of teacher professional development at home and abroad, master teachers’ attitudes, perplexities, and suggestions in teaching and development, and summarize professional development models suitable for teachers in different regions. The second is to develop and develop training courses, and include training programs in the credit system of teacher training. No matter what the development of artificial intelligence, teachers should not give up their dominant position, comply with the trend of The Times and actively carry out their own changes is the best way not to be eliminated by The Times.

B. Strengthen Teachers’ Subjectivity and Show Humanistic Care

Artificial intelligence is a specific sequence set by a computer program to complete a specific target task, as “digital immigrant” educators, in order to free themselves from the influence of artificial intelligence on teaching staff, they must strengthen their learning ability, pay attention to the cultivation of humanistic literacy, and develop the side that artificial intelligence cannot reach.

Although artificial intelligence can be programmed to input a large amount of data into the teaching system, which effectively alleviates the teacher's job burnout, the core value of teachers is to provide "emotional value" for students. "Expertise alone won't do. After special training, he may become a useful machine, but he can't become a harmonious development person." [15]. Emotion is one of the qualities that artificial intelligence cannot replace human beings [9]. Because of the inherent nature of artificial intelligence, it has always been a big flaw in terms of emotion. In the era of artificial intelligence, educators do not focus on imparting professional knowledge and skills to students, but more on influencing students with their own teaching style, personal charm, spiritual accumulation, and life experience, cultivating students' correct values, outlook on life and ethics, and helping students to recognize, understand and integrate into society. And together with students to build a full spiritual world. Such value orientation and follow ability are unmatched by other AI machines. In traditional information teaching, the birth of artificial intelligence makes the teaching process have a tendency to favor cognition and ignore emotion. If we rely on the massive data provided by intelligent education for a long time, the lack of teacher-student affection will make students' values tend to be single.

Advances in artificial intelligence will inevitably have an impact on some areas of teaching, but as teachers, we still have our human strengths and strengths. Focus on cultivating students' comprehensive quality in education, which can not be replaced by artificial intelligence. The communication between teachers and students is a process of mutual inspiration and spiritual influence, and a kind of honest trust and mutual respect are generated between teachers and students. Excessive use of intelligent teaching methods will lead teaching to the misunderstanding of "technical learning". If teachers can pay attention to the life growth of students, touch the hearts of students, and make the emotional world of students richer in the teaching process, this is a kind of education with temperature, which can not be replaced by artificial intelligence.

C. Realize the Role Transformation and Establish the Educational Concept of Lifelong Learning

The penetration of artificial intelligence into education and teaching has become a trend, and the arrival of the intelligent era accelerates the transformation of the role of teachers. Teachers should recognize their own positioning, rebuild their own role, and adapt to their own identity change as soon as possible. Teachers should become analysts of personalized learning. Due to the differences in students' personality, cognitive style, and knowledge mastery, teachers should design personalized development models for each student according to their different characteristics. In the face of massive student information, teachers can use artificial intelligence technology to refine and simplify it, and carry out continuous and dynamic data analysis, master the actual situation of each student, and design personalized development methods for it.

Teachers should become lifelong learners in the age of artificial intelligence. The era of artificial intelligence advocates "lifelong learning", and the professional development of teachers is related to the vital interests of every teacher. If you reject intelligent technology and have no motivation for self-development, you will eventually be eliminated by society. Therefore, teachers should make their own career planning, adopt a positive attitude to cope with the development of The Times and the changes of policies, establish an ecological concept of lifelong learning, continuously update their educational concepts, and formulate a long-term career development plan. In particular, in the online teaching platform, teachers can continuously change their teaching concepts and update their knowledge structure through learning rich educational resources, so as to achieve their professional growth. Through artificial intelligence technology, teachers can establish career data models, collect real-time growth data, and obtain evaluations of classroom involvement, emotions, teaching behaviors, and other dimensions through continuous dynamic data, so as to improve teacher-student interaction, teaching mode, knowledge structure and teaching planning, enhance teaching effectiveness, and promote their own professional development.

IV. CONCLUSION

Artificial intelligence is the general trend of human development, which not only changes the speed, scale, and structure of education development, but also changes the educational environment in which teachers live, thus affecting the play of teachers' dominance. The leading role of teachers is not only a kind of professional skill, but also a kind of education ability, which is reflected in the continuous improvement of the principal status of middle school students in the process of education. With the development of The Times, the demand of society for the quality of talents is getting higher and higher. In the process of training students, teachers must grasp their main position and realize their own development. The advent of the era of artificial intelligence has provided us with more learning methods and learning tools. However, in order for AI to make greater contributions to education, teachers must play a leading role. Teachers should adhere to man-machine coordination and strengthen artificial intelligence literacy training; Strengthen teachers' subjectivity and show humanistic care; Realize the role transformation and establish the educational concept of lifelong learning. The leading role of teachers is related to the cultivation of students' learning initiative and creativity. Therefore, as teachers in the new era, when facing the opportunities and challenges of artificial intelligence, they should actively adapt to this trend. At the same time, teachers should keep pace with The Times, follow the development trend of The Times, and constantly improve and innovate. Only the continuous improvement of teachers' self-ability can prevent teachers from losing their dominant position in the process of man-machine collaboration.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Rui Li collected the information and wrote the paper; Dan Fu gave instructions for the article; both authors had approved the final version.

ACKNOWLEDGMENT

I would like to thank my tutor Dan Fu for her thoughtful guidance on my article.

REFERENCES

- [1] S. Russel and P. Norvig, *Artificial Intelligence – A Modern Approach*, Pearson Education, 2010.
- [2] T. Baker and L. Smith. (February 2019). Educ-AI-tion rebooted? Exploring the future of artificial intelligence in schools and colleges. [Online]. Available: https://media.nesta.org.uk/documents/Future_of_AI_and_education_v5_WEB.pdf
- [3] CPC Central Committee and State Council. (July 2017). New generation artificial intelligence development plan. [Online]. Available: http://www.cac.gov.cn/2017-07/21/c_1121353529.htm
- [4] Y. Li, C. Yang, and L. Ming, "Application of artificial intelligence in education," *Information and Computer*, no. 10, pp. 229–230, 2021.
- [5] K. Yang and D. Xue, "Status and prospect of the application of artificial intelligence technology in education," *Science and Technology Innovation and Application*, no. 12, pp. 189–192, 2022.
- [6] S. Niu, "A review of research on the application of artificial intelligence in education," *Information Technology and Informatization*, no. 7, pp. 193–195, 2019.
- [7] L. Zhao, Z. Li, and X. Cao, "Teacher identity construction in the era of artificial intelligence: Realistic dilemmas and practical directions," *Journal of Jiangnan University (Humanities and Social Sciences Edition)*, vol. 20, no. 6, pp. 105–113, 2021.
- [8] W. Hu, "Teachers' role dilemma and action strategy in the era of artificial intelligence," *Modern University Education*, no. 5, pp. 79–84, 2019.
- [9] L. Liu and R. Liu, "Teachers' role transformation in the era of artificial intelligence: Dilemma and breakthrough – based on Heidegger's philosophy of technology perspective," *Open Education Research*, vol. 26, no. 3, pp. 46–47, 2020.
- [10] J. Du, R. Huang, Z. Li, *et al.*, "Connotation and construction principles of artificial intelligence ethics in the era of intelligent education," *Audio-visual Education Research*, vol. 40, no. 7, pp. 21–29, 2019.
- [11] S. Liu, Y. Chai, S. Liu, *et al.*, "A Sino-German perspective on AI-driven educational technology development: A review of the 2019 Sino-German bilateral symposium," *Research on Audio-visual Education*, vol. 40, no. 8, pp. 105–113, 2019.
- [12] X. Hao, X. Gu, T. Zhang, *et al.*, "Man-machine collaborative learning: Practice model and development path," *Open Education Research*, vol. 28, no. 4, pp. 31–41, 2022.
- [13] F. Wu and H. Tian, "Human-machine collaborative precision learning intervention: Dynamic mechanism, logical path and practical model," *Open Education Research*, vol. 29, no. 2, pp. 81–90, 2019.
- [14] X. Yu, L. Chao, and G. Meng, "Research on basic flow and interaction model of human-in-loop AI training," *Information and Information Work*, vol. 43, no. 5, pp. 34–41, 2022.
- [15] J. Su, "From 'Man as Man' to 'Teacher as Teacher' Party School of the CPC Qingdao Municipal Committee," *Journal of Qingdao Administration College*, no. 1, pp. 114–118, 2017.

Copyright © 2024 by the authors. This is an open access article distributed under the Creative Commons Attribution License ([CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)), which permits use, distribution and reproduction in any medium, provided that the article is properly cited, the use is non-commercial and no modifications or adaptations are made.