



The Empirical Study on Developing Strategies of AI Education in China

Zhipeng Wang¹

¹*School of Architecture and Urban Planning, Anhui Jianzhu University, Ziyun Road, Hefei, Anhui*
zp_wang@ahjzu.edu.cn

ABSTRACT

Under the background of the integration of artificial intelligence and education, this paper introduces and analyses the developing policy of intelligent education in China. Firstly, it analyses the strategies of high-quality development of AI education in China from the aspects of top-level design, education and teaching reform, intelligent education environment construction, intelligent education literacy improvement, innovative talents training, high-quality education resources construction and ethical risk response. Secondly, regression analysis is used to test the specific benefits of the policy. Research conclusions provide reference for the intelligent development of education in other developing countries.

Keywords: *Artificial Intelligence; Intelligent Education; Education Policy; Regression Analysis; China*

1. INTRODUCTION

At present, artificial intelligence technology is not only accelerating the industrial restructuring and economic and social transformation of the fourth industrial revolution, but also playing a great potential in promoting personnel cultivation and educational reform. Throughout the trend of the times, the development of artificial intelligence is unprecedentedly active, and there is an urgent need for the support of intelligent professionals to promote industrial upgrading. Under the background of the deep integration of artificial intelligence and education, how to use artificial intelligence to promote the high-quality development of education in the new era has become an important topic to be studied urgently in China.

2. INTERACTION BETWEEN ARTIFICIAL INTELLIGENCE AND EDUCATION

With the rapid development of new technologies such as artificial intelligence, big data and blockchain, social transformation puts more emphasis on cultivating people' key competencies, while the traditional education system has been unable to meet the needs of new personnel cultivation, which urgently requires artificial intelligence to give important impetus to the "de-standardization" process of personnel cultivation. The international community has paid more and more

attention to improving the quality of education, predicting and cultivating the necessary skills of the future society, coping with major public crises and promoting educational equity.

For example, the development plan for a new generation of artificial intelligence issued by the State Council of China in 2017 pointed out that it is necessary to use intelligent technology to accelerate the reform of personnel cultivation mode and teaching methods, and build a new education system including intelligent learning and interactive learning [6]. The action plan for artificial intelligence innovation in colleges and universities issued by the Ministry of Education of China in 2018 takes the cultivation of artificial intelligence talents as one of the main objectives to improve the quality of personnel cultivation and national independent innovation ability by improving the personnel cultivation system in the field of artificial intelligence, so as to promote the innovative development and wide application of artificial intelligence [4].

In this context, Chinese government have taken policy measures from the construction of education system, the reform of education evaluation, the cultivation of teachers and other aspects, which provides a strong guarantee for steadily promoting the empowerment, innovation and reshaping of artificial

intelligence and improving the quality of education development.

3. THE DEVELOPING VISION OF AI EDUCATION IN CHINA

At present, artificial intelligence is becoming an effective supporting means to promote the high-quality development of education. For example, the document of “Chinese educational modernization 2035” released in 2019 points out that with personnel cultivation as the core, we can intelligently drive the innovative development of education by improving the level of campus intelligence, exploring new teaching forms, innovating educational service formats and promoting the reform of educational governance [7].

In 2021, the Ministry of Education and other five government sectors issued the document of “Guiding Opinions on Promoting The Construction of New Educational Infrastructure and Building A High-Quality Education Support System”, which proposed to use artificial intelligence technology to popularize teaching application, expand teacher research and training application, and enhance the monitoring ability of education system [5]. The education system in the future will move towards intelligence from multiple dimensions, accelerate the integration of artificial intelligence with student learning, teacher development, school construction, educational governance, educational evaluation and educational equity.

4. THE DEVELOPING STRATEGIES OF AI EDUCATION IN CHINA

The intelligent era puts forward new requirements and tests for the development of education. Through top-level design, teaching reform, environmental construction, quality improvement, talent training, resource construction, risk response and other work, the goal of in-depth integrated development of artificial intelligence and education can be achieved.

4.1. Constructing the development framework of AI education from top-level

At present, Chinese educational development has made remarkable achievements, but in the process of the development of AI education, there are still some problems, such as unbalanced development, insufficient technology application, and difficult implementation of policies [3]. The lack of scientific and systematic top-level design has become one of the important factors that hinder education from moving forward to a fairer and higher quality. In order to ensure the same frequency resonance and integrated development of AI education, a high-quality development framework of AI education based on the local and the world should be

built. Firstly, in terms of management planning, the government and education departments should establish an AI education expert team to guide and coordinate the pilot implementation of the action plan. Secondly, in terms of exploration and innovation, the construction of scientific and technological forces need to be accelerated and key technologies of artificial intelligence should be tackled.

4.2. Promoting the demonstration application and teaching reform of intelligent education scene

The Fourth Plenary Session of the 19th CPC Central Committee pointed out that we should build an education system serving lifelong learning for the whole people, and improve the overall and coordinated development mechanism of vocational and technical education, higher education and continuing education, give full play to the advantages of network education and artificial intelligence, and build a learning society. Therefore, in the demonstration and application of innovative intelligent education scenes at all levels and all kinds of education, we should clarify the key points and deeply promote the comprehensive reform of education and teaching with artificial intelligence.

4.3. Consolidating the new infrastructure of education and building a large-scale intelligent environment for high-quality education

The demand for talents in the future society needs the support of science and technology more than ever before. It is worth thinking about how to seize the opportunity of new infrastructure to build a large-scale, intelligent and high-quality education and teaching environment and realize the high-quality development of AI education. In this regard, this study believes that it can be done from the following aspects.

Firstly, building a new information network infrastructure supported by artificial intelligence technology, which means promoting the integration of “5g + cloud network”, supporting the construction of campus internet and upgrading campus LAN.

Secondly, accelerating the development of educational innovation and application, promoting educational process re-engineering and model reconstruction with intelligent technology, and building a new intelligent environment supporting large-scale and high-quality education.

Thirdly, accelerating the formulation of education terminal standards to escort the high-quality, stable, high-speed and safe development of education.

4.4. Forming an intelligent education development community and improving the intelligent education literacy of teachers and students

Improving intelligent education literacy is an important way to cultivate teachers' application ability of artificial intelligence technology and the key for students to master the necessary character and skills of learning methods in the intelligent era. Facing the teaching and learning practice field of AI education, teachers and students should expand and improve their intelligence literacy to meet future educational challenges. From the perspective of teachers, we should strengthen the quality of intelligent education and adapt to the new changes brought by artificial intelligence to education from the aspects of knowledge, ability, thinking and cultural value. In addition, we should speed up the integration of subject and information literacy, and cultivate students' intelligent ability with the two-way help of technology and teaching.

From the perspective of students, we should expand the opportunities for students to accept intelligent learning with the help of new means and methods, explore a new model for improving students' intelligent ability, and correctly guide students to solve the learning problems in the intelligent era through computing thinking, collaborative learning, practical innovation and other ability. It should be noted that the cultivation of teachers' and students' intelligent education ability needs to gather various forces such as colleges and universities, enterprises and primary and secondary schools, and take "theory practice research" as the main axis to jointly cultivate innovation and form an intelligent education development community.

4.5. Reconstructing the goal of education and cultivating innovative talents in the era of intelligence

Artificial intelligence has brought unprecedented opportunities for learning change. In the era of intelligence, the high-quality development of education needs to reconstruct the goal of education and improve the training system of innovative talents.

Firstly, improving students' necessary learning ability and thinking ability in the era of intelligence. we not only should improve students' learning ability and guide students to develop good autonomous learning habits. In addition, we should focus on cultivating students' creativity and critical thinking, so as to train students to have the ability to solve complex problems.

Secondly, promoting the introduction of artificial intelligence, programming technology and other courses into primary and secondary school, and introducing the comprehensive development of science and innovation

steam education in primary and secondary schools as well.

Thirdly, supporting the construction of artificial intelligence related majors in colleges and universities, which means improving the training system of innovative talents, and strengthen the training of high-quality talents in artificial intelligence majors [1].

4.6. Accelerating the improvement of intelligent education curriculum system and strengthening the construction of high-quality educational resources

Artificial intelligence is a strategic element that can not be ignored in the high-quality development of education in China in the future, and digital and intelligent educational resources are one of the important influencing factors to improve the quality and effect of education and teaching in the new era of educational intelligence. In order to strengthen the construction of high-quality educational resources, we should pay attention to the curriculum development, teaching tools and mode innovation integrating artificial intelligence.

Firstly, we should design and develop artificial intelligence related courses and supporting teaching materials, and speed up the leading edge of artificial intelligence in colleges and universities, the practical application of artificial intelligence in vocational education and the universal education in primary and secondary schools [2]. For example, the opening of the "Application of artificial intelligence in education" course not only deepens college students' understanding of the application of artificial intelligence, but also guides educators to contact and use artificial intelligence in teaching practice.

Secondly, developing intelligent tools integrated with curriculum teaching to help teachers and students teach and learn more efficiently and wisely in the classroom.

4.7. Facing up the ethical safety problems of artificial intelligence application

With the generation of educational big data, educational alienation and data privacy disclosure have become unavoidable ethical security issues in the process of improving the quality of educational development by intelligent technology. In this regard, it is necessary to establish and improve the guarantee mechanism of artificial intelligence application to eliminate and avoid the risk of educational alienation caused by technology application.

5. THE EMPIRICAL TEST

5.1. Data source and variable construction

3243 college students of grade 2021 from five universities in Hefei were investigated. A total of 3000 questionnaires were collected from September 2018 to August 2019. The questionnaire includes the satisfaction with the above seven intelligent education development policies and students' intelligent learning performance data.

This study combines two kinds of indicators: one is the satisfaction with the seven intelligent education policies, and the other is the academic performance of students after accepting intelligent education.

5.2. Research methods and tools

This study constructs a regression analysis model to analyse the effectiveness and specific results of China's AI education policy. Stata 15.0 was used for statistical analysis.

5.3. Data analysis results

5.3.1. Correlation analysis

The research analyses the correlation of all predictive variables, calculates the Pearson correlation coefficient between each variable and learning performance, and measure the linear correlation between variables. At the same time, the variance expansion factor (VIF) between variables is calculated to detect whether there is a high degree of collinearity between them. If the correlation coefficient is less than 0.1 or VIF is greater than 10, it indicates that the variable has poor prediction effect on learning performance and should be deleted. It can be found from table 1 that among the 7 prediction variables, the correlation coefficient of policy 7 and students' performance is less than 0.2, and the VIF values of policy 4 and policy 5 are higher than other variables.

Table 1: Correlation analysis between intelligent education development policy and students' performance

Intelligent education policy satisfaction	Pearson correlation coefficient	VIF
Policy 1	0.488**	1.084
Policy 2	0.451**	1.158
Policy 3	0.401**	1.104
Policy 4	0.399**	1.875
Policy 5	0.294**	1.681
Policy 6	0.233**	1.060

Policy 7	0.102**	1.029
----------	---------	-------

Note: * indicates at 0.05, ** indicates significant at 0.01 level

5.3.2. Regression analysis

The regression analysis result is shown in the table 2.

Table 2: Regression analysis between intelligent education development policy and students' performance

Satisfaction	Students' performance		
	Coef.	t	VIF
Policy 1	0.007**	0.47	1.57
Policy 2	0.039**	1.53	1.46
Policy 3	0.047**	1.55	1.72
Policy 4	0.066**	2.54	1.01
Policy 5	0.024**	0.77	1.31
Policy 6	0.027**	1.06	1.12
Policy 7	0.033**	1.30	1.14
Constant	0.385	2.76	
F	20.61	Prob> F	0

Note: * indicates at 0.05, ** indicates significant at 0.01 level

The results of regression analysis show that there is a positive correlation between students' grades and policies, indicating that the policy of intelligent education has a positive effect on the improvement of students' grades. Among the seven policies, policy 4 has the highest impact effect, followed by policy 3 and policy 2, and policy 1 has the lowest impact effect.

6. CONCLUSIONS

In the new era, Chinese education development has stepped to a new level, the high-quality development system of education has been gradually established and improved, and the construction of intelligent learning environment, the exploration of intelligent education mode, the construction of new teachers and the improvement of educational governance ability have achieved initial results. In the process of dealing with new technologies and challenges and drawing up a blueprint for the development of high-quality education, the state should focus on the new mission, new requirements and new direction of education development in the new era, establish the concept of scientific and technological innovation promoting the development of education in the intelligent era, use scientific and technological empowerment to accelerate the in-depth integrated development of artificial intelligence and education and teaching, and make greater contributions to promoting the construction of a modern power in education.

ACKNOWLEDGEMENTS

This paper was supported by Anhui Province Social Science Innovation and Development Research Project “The Research of the development form of ‘artificial intelligence+ education’ ”. (Program No.2020CX150)

REFERENCES

- [1] Belpaeme T, Kennedy J, Ramachandran A, et al. (2018). Social robots for education: A review. *Science Robotics*, (21):1-10.
- [2] Buza V, Hysa M. (2020). School-family cooperation through different forms of communication in schools during the Covid-19 pandemic. *Thesis*, (2):55-80.
- [3] Miao F, Holmes W, Huang R and Zhang, H., 2021. *AI and education: A guidance for policymakers*. Paris, France: UNESCO Publishing, 13-37.
- [4] Ministry of Education of the People's Republic of China., 2018. Notice of the Ministry of education on printing and distributing the action plan for artificial intelligence innovation in Colleges and Universities.
http://www.moe.gov.cn/srcsite/A16/s7062/201804/t20180410_332722.html
- [5] The Central Committee of the Communist Party of China, the State Council, the development and Reform Commission of the central network information office of the Ministry of education, the Ministry of industry and information technology, the Ministry of Finance and The People's Bank of China., 2021. Guidance on promoting the construction of new educational infrastructure and building a high-quality education support system.
http://www.gov.cn/gongbao/content/2021/content_5636150.htm
- [6] The Central People's Government of the People's Republic of China., 2017. Circular of the State Council on printing and distributing the development plan of the new generation of artificial intelligence.
http://www.gov.cn/zhengce/content/2017-07/20/content_5211996.htm
- [7] The Central People's Government of the People's Republic of China., 2019. The CPC Central Committee and the State Council issued 2035 of China's educational modernization.
http://www.gov.cn/xinwen/201902/23/content_5367987.htm.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

