Realistic Picture of Education Governance Modernization Based on Artificial Intelligence Background and Response Strategies

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Abstract. The modernization of education governance cannot be separated from the application of artificial intelligence technology, and the introduction of artificial intelligence technology provides accurate data support and efficient tool application for education governance. Artificial intelligence achieves intelligent collection, processing and analysis of education data through big data analysis, machine learning, natural language processing and other technological means, which provides accurate data support for education governance and improves the efficiency of governance and decision making in a Science. However, the modernization of education governance also faces challenges such as the maturity of technology, the transformation of governance concepts and the existence of insufficient systems. This paper explores the realistic picture of the modernization of education governance against the background of artificial intelligence, and proposes corresponding coping strategies from the conceptual, systemic and technological levels, including the establishment of a student-centred education concept, the enhancement of lifelong learning, the cultivation of innovative capabilities, and the construction of an intelligent education platform.

Keywords: artificial intelligence; educational governance; modernization; realistic strategy

1 Introduction

Artificial intelligence technology realizes the deep mining and intelligent analysis of educational data through big data analysis, machine learning and other means, providing unprecedented accurate data support for administrators and making educational decision-making more scientific and reasonable. At the same time, the application of intelligent tools also greatly improves the efficiency of education governance[1], reduces the workload of teachers and promotes the personalized development of students. The modernization of education governance is not an overnight solution, and it is necessary to overcome the barriers of technology maturity, traditional governance concepts, institutional systems and other aspects[2].

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2 The Realistic Picture of Education Governance Modernization in the Context of Artificial Intelligence

2.1 Analysis of the Impact of Artificial Intelligence on Education Governance

Artificial intelligence realizes the intelligent collection, processing and analysis of educational data through big data analysis, machine learning, natural language processing and other technical means. These technologies provide accurate data support for education governance, enabling administrators to gain insight into the current state of education and predict development trends based on real-time[3], comprehensive data, so as to make more scientific and rational decisions. At the same time, the application of intelligent tools also greatly improves the efficiency of education governance, such as intelligent class scheduling system, online examination and automatic marking system, etc., which greatly reduces the workload of teachers, so that they can focus more on teaching itself.

2.2 Realistic Challenges of Education Governance Modernization

The maturity and popularity of technology application has become a key factor restricting the modernization of education governance. Although AI technology has achieved remarkable results in some areas, its widespread application in education governance is still constrained by issues such as technological maturity, compatibility, and safety. The level of technological development varies between different regions and schools, leading to an uneven advancement of educational governance modernization.

3 The Coping Strategy of Education Governance Modernization under the Background of Artificial Intelligence

3.1 Response Strategies at the Conceptual Level

Establish a student-centered education concept: traditional education is often teacher-centered, focusing on the transmission and indoctrination of knowledge. In the age of artificial intelligence, educational governance should pay more attention to the individualized needs and development of students, and regard students as the main body and core of educational activities. This means that education governance should be committed to providing students with richer, more diversified and personalized learning resources and paths, focusing on the overall development and growth of students, and cultivating their innovative spirit and practical ability[4].

3.2 Response Strategies at the System Level

Put people-oriented and innovation-driven as the core of education governance. This means that the goal of education needs to be rethought, not only to impart knowledge,

but also to cultivate comprehensive literacy that can adapt to the challenges of future society. It is also necessary to recognize the potential of artificial intelligence in education and encourage education administrators, teachers and students to explore and apply new technologies together to promote innovation in education models[5].

In terms of curriculum content and structure, in-depth reforms are needed. This includes the development of AI-related courses with interdisciplinary integration, the establishment of an "AI+X" curriculum system, and the strengthening of practical teaching sessions to improve students' practical and innovative abilities. At the same time, it is also necessary to create an open-source and shared "AI education content library", and encourage the participation of multiple parties to jointly promote the updating and improvement of AI education content.

4 Case Study

As a leading institution of higher learning in China, University A has proactively embraced the call for national education modernization by leveraging artificial intelligence technology. The university's smart campus construction project, initiated in 2018, serves as a prime example of how AI can drive educational governance modernization. This case study delves into the specifics of the project, highlighting its alignment with the theoretical frameworks and challenges discussed earlier.

4.1 Smart Campus Project Overview.

The smart campus project aims to comprehensively upgrade the education governance system by integrating advanced technologies such as artificial intelligence, big data analytics, and machine learning. These technologies enable intelligent collection, processing, and analysis of educational data, aligning perfectly with the AI-driven education governance model outlined in the previous sections.

4.2 Connection to Conceptual Level.

The project embodies the conceptual level strategies proposed earlier, particularly the establishment of a student-centered education concept. By leveraging AI tools, University A has tailored learning experiences to cater to individual students' needs and preferences, fostering personalized learning paths. This transition from a teacher-centered to a student-centered approach underscores the importance of recognizing students as the core of educational activities[6].

4.3 Connection to System Level.

At the system level, the smart campus project reflects the university's commitment to people-oriented and innovation-driven education governance. By incorporating AI-related courses into its curriculum and establishing an "AI+X" curriculum system, University A has nurtured a culture of continuous learning and innovation. This not

only equips students with the skills to adapt to future societal challenges but also encourages teachers and administrators to explore and apply new technologies, thereby promoting educational model innovation.

The following formulas were mainly used in this study:

$$\alpha = \text{frackk} - (1 - \text{frasum}_{t=1}^{k} \Sigma_{p}^{2} \theta)$$

where k is the number of items in the questionnaire, σy2 is the variance of the score of the ith item, and σx2 is the variance of the total score of all items. This formula is used to calculate the overall reliability of the questionnaire.

Mean (Mean) formula in descriptive statistics:

Mean is one of the most commonly used indicators in descriptive statistics to indicate the average level of data. Its calculation formula is:

$$\text{barx} = \text{frac1nsumi} = 1\text{n}\ \theta$$

Where n is the number of samples and xi is the value of the ith sample. This formula is used to calculate the mean under categories such as gender, specialty, etc.

StandardDeviation (StandardDeviation) formula:

Standard deviation is a measure of the degree of dispersion of the data and is calculated by the formula:

$$\text{s} = \text{sqrtfrac1nsumi} = 1\text{n(xibarx)}^{2}$$

Where n is the number of samples, xi is the value of the ith sample, and $\bar{x}$ is the sample mean. This formula is used to assess the volatility of data and is used in both descriptive analysis and test of variance.

Expectation-PerceptionGap formula:

In Expectation-PerceptionGap analysis, the gap between the expected and actual perceived values needs to be calculated. This gap can be calculated by simple subtraction:

$$\text{textGap} = \text{textExpectation} + \text{textPerception}\ \theta$$

Where Expectation is the user's expectation level of a service or product and Perception is the level actually perceived by the user. This formula is used to analyze the gap between Expectation and Actual Perception under five dimensions (Tangibility, Reliability, Responsiveness, Assurance and Empathy).

In order to verify whether the questionnaire design of this study is scientific, it is necessary to analyze the reliability of the collected questionnaire data. In this study, the reliability of the evaluation indicators was analyzed using SPSS 26.0 data statistical analysis software to ensure the reliability and consistency of the indicators in the questionnaire. According to the data in Table 1, the overall Cronbach's alpha alpha coefficient of the questionnaire is 0.984, which is greater than 0.9, indicating that the survey questions are reliable (Table 1).

Table 1. Data analysis table.

Dimension	Perception		Expectation	
	NumberofIndicators	Cronbach'sα	NumberofIndicators	Cronbach'sα
Tangibility	4	0.879	4	0.913
Reliability	4	0.900	4	0.929
Responsiveness	4	0.854	4	0.908
Assurance	5	0.911	5	0.928
Empathy	5	0.911	5	0.933
Overall	22	0.973	22	0.982

The first part of the questionnaire was about demographic variables and other characteristics, including gender, grade and major, out of the valid sample of the survey, 1750 questionnaires were received and after removing the invalid responses, the valid questionnaires were 1398, which is 80%. The composition of the respondents was as follows[7].

(1) Gender analysis, taking into account the nature of the issuing institutions, seeks to be balanced in terms of gender to ensure the authenticity of the data obtained, so as to effectively reflect the problems of learning support services in higher education. The study shows that in terms of gender, males accounted for 46.9% and females accounted for 53.1%, and the proportion of males and females was generally balanced (Table 2).

Table 2. Demographic variables.

DemographicVariables	Categories	Counts	Percentages
Gender	Male	656	46.9%
	Female	742	53.1%
YearLevel	Freshman	177	12.7%
	Sophomore	459	32.8%
	Junior	414	29.6%
	Senior	213	15.2%
	GraduateStudent	135	9.7%
Major	Humanities&SocialSciences	442	31.6%
	Science	228	16.3%
	Engineering	497	35.6%
	Arts	106	7.6%
	Others	125	8.9%

(2) Grade level analysis, different grades issued questionnaires, try to cover all students in the institution including undergraduate and graduate students, but considering the significant difference in the number of graduate students and undergraduates, the number of graduate students is less than the number of undergraduates, specially focusing on undergraduates as the key research object, and strive for a balanced

number. According to the research, in terms of grade distribution, sophomores and juniors accounted for the largest proportion, with 32.8% and 29.6%, respectively, while seniors accounted for about 15.2%, freshmen for 12.7%, and graduate students for 9.7%.

(3) Professional analysis, students of different majors have different study habits, different professionalism, and different learning resources needed, which will result in different understanding of learning support services, different perspectives of suggestions, and different perceptions of existing learning support services. Thus, the author can obtain the information of the research subjects from multiple directions, angles and fields, and the survey data obtained are more comprehensive and extensive, and the data are more real and effective. The study shows that the engineering category accounts for the largest share of 35.6%, which is in line with the distribution of the number of majors in engineering colleges and universities, followed by humanities and social sciences accounting for 31.6%, science accounting for 16.3%, and art and other categories accounting for a smaller share of 7.6% and 8.9%, respectively.

Most students believe that the carrier on which the learning support services of colleges and universities are based should provide sound and perfect services at the tangible level, so the expectations for the tangible services of colleges and universities are very high, and almost all of the surveyed respondents expect more than 4.10 points for the tangible nature of the management services, and college students especially value modern teaching facilities and learning platforms, with an expectation value of 4.20 points or so. The expectation value is around 4.20 points. In terms of perception, the mean value of university students' perceptions of learning resources and learning platforms is lower, and the difference in perceived expectations is larger for learning platforms and learning resources. For the existing learning support services, there are some gaps between the tangible services of learning support services perceived by the respondents and the expected services in general (Table3).

Table 3. Survey data sheet.

SerialNo	Content	Perception-Value	ExpectationValue	Perception-Expectation
1	ModernTeaching-Facilities	4.13	4.21	-0.08
2	LearningResources	4.06	4.16	-0.10
3	LearningPlatform	4.08	4.20	-0.12
4	Self-ServiceFacilities	4.09	4.18	-0.09

(1) Modernized Teaching Facilities

A total of four questions were designed for the tangible aspects, which are related to modern teaching facilities, learning resources, learning platforms and self-service facilities. Among them, the respondents showed the highest expectation in modern teaching facilities, and further understanding of the reasons for the high expectation, it

can be found that because N-school is an industry-specific university, its national engineering specialties accounted for as high as 26.09% of the total number of engineering majors in the university[8]. This kind of institutions on the cultivation of talents will be more specialized training system is also more targeted, often this kind of education needs to use the application and industry strong courses and practice to ensure that the modern teaching facilities are complete to a large extent affects the learning experience of students. For example, the learning of virtual reality technology requires more specialized teaching facilities.1 In addition to high expectations, the mean value of the actual perception of modern teaching facilities is also the highest among the tangibility dimensions. (Table 4)

Table 4. Practice support service table.

Dimension	Average Perception	Average Expectation	Service Quality Gap
Tangibility	4.09	4.19	-0.10
Reliability	4.13	4.29	-0.15
Responsiveness	3.93	4.28	-0.35
Assurance	4.07	4.26	-0.19

It can be seen that School N has a high level of construction and service on modernized teaching facilities, which meets the learning needs of learning to a large extent.

(2) Learning resources

Respondents' perception score of learning resources is the lowest in the tangibility dimension, which indicates that there is still room for improvement in the construction and application of learning resources in colleges and universities. At present, the learning resources in N-school institute are mainly provided by the library, and the types include paper collections, Chinese and foreign language periodicals, electronic books, etc., and also contain a variety of magnetic tapes, audio and video and other kinds of carriers, which to a large extent satisfy the learning needs of students. However, there are still some problems in the distribution of literature resources, resource utilization and integration. The categories of literature resources in N-school are mainly in natural sciences, and humanities and social sciences account for a relatively small proportion.

5 Conclusion

This paper comprehensively analyzes the reality picture and response strategy of the modernization of educational governance based on the background of artificial intelligence. The introduction of artificial intelligence technology provides accurate data support and efficient tool application for educational governance, which promotes the development of educational governance in the direction of more openness, synergy and precision. However, the modernization of educational governance also faces real

challenges such as the maturity of technology, the transformation of traditional governance concepts, and the inadequacy of the institutional system. In order to cope with these challenges, this paper proposes corresponding coping strategies from the conceptual level, systemic level and technical level, including the establishment of a student-centered education concept, the strengthening of lifelong learning and the cultivation of innovation ability, and the construction of an intelligent education platform.

References

1. Liu Liwei, Peng Jiaojiao. Higher education governance under the perspective of artificial intelligence: opportunities, challenges and coping strategies [J]. Science and Education Guide-Electronic Edition (Late), 2022(8):14-16.
2. WANG You-Mei, WANG Dan, LIANG Wei-Yi, et al. Agile governance: A new model for ethical governance of educational artificial intelligence[J]. Research on Electrochemical Education, 2023, 44(7):21-28.
3. WANG Shutao, Bao Junwei. Social experiment on artificial intelligence education: interpretation and construction [J]. Research on Electrochemical Education, 2023, 44(4):33-38.
4. Chen Guohua, Zheng Lei." Masking" and "Unmasking": Discourse Transformation of Ideological and Political Education in the Age of Artificial Intelligence and Its Response[J]. Theory Guide, 2023(2):117-123.
5. Yang Jiahui. Textual Research on China's Artificial Intelligence Education Policy[D]. Hubei Normal University, 2023.
6. GUO Shengnan, WU Yonghe, ZHANG Zhi. Modeling and Practical Path of Artificial Intelligence Education Brain[J]. Open Education Research, 2022, 28(4): 9. DOI: 10.13966/j.cnki.kfjyyj.2022.04.003.
7. Teng Changli, Deng Ruiping. Intelligent technology empowers high-quality development of education: connotation, challenge and response [J]. Exploration of Higher Education, 2023(1): 8-13. DOI: 10.3969/j.issn.1673-9760.2023.01.003.
8. Xu HX, Shen LM." Intelligence+Education": Application Scenarios, Risk Challenges and Governance Countermeasures [J]. Fudan Education Forum, 2023,21(2):24-30.