Article

Reconstruction of School Governance Model of Basic Education in the Age of Artificial Intelligence — From the perspective of man-machine collaboration

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Abstract: Artificial intelligence is continuing to reshape the technical foundation and organization mode of education operation, and the governance mechanism of basic education schools is also facing new adjustment requirements. Using intelligent technology to improve management efficiency and governance quality has become an important issue in future school construction. Starting from the regional institutional environment, the digital ability should be fully incorporated into the educational supervision rules and implementation mechanism, and the new connotation of multi-collaborative governance in the AI era and the new way of educational governance supported by AI technology should be deeply understood.

Keywords: artificial intelligence; School governance; Digital governance

1. Introduction

With the continuous improvement of educational governance requirements, school management also needs to change from an empirical and transactional mode to a more standardized, collaborative and data-driven mode. At the same time, computing power, data processing and artificial intelligence technology have rapidly evolved, and related technologies have been used in various scenarios such as autonomous driving, biomedicine, food traceability and education and teaching, thus obtaining new technical conditions in the field of education [1-4]. The national level also continues to promote the development of artificial intelligence and digital education. Under the above technical and policy environment, this paper further discusses how regional education supervision changes from traditional institutional arrangement to digital governance under the background of AI, and explores the intelligent supervision mechanism for basic education schools in combination with the actual situation in Shandong; Based on the current situation of educational governance in basic education schools, this paper discusses the new connotation of multi-collaborative governance in educational governance in the AI era, and how to realize new ways of educational governance with the help of AI technology.

1.1. The New Connotation and New Ways of Governance of Education in the AI Era

The local supervision system still faces problems such as insufficient regional characteristics, limited supervision independence and untimely updating of some policies [5-7]. The development of artificial intelligence, big data and Internet of Things has further amplified the shortcomings of traditional supervision methods in data governance. On the one hand, new technologies provide new tools for process monitoring, data analysis and risk identification; On the other hand, there are still many problems in the real education system, such as mutual separation between platforms, limited data circulation, and inconsistent standards, which makes it difficult to fully transform technical value into

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supervision efficiency [8]. Similar information barriers are not unique in the field of education, but also discussed in the fields of medical health, government services and aviation logistics [9-12]. Therefore, the digitalization of educational supervision can not only stay at the level of equipment or platform construction, but also need to simultaneously promote the reconstruction of data norms, sharing mechanisms and governance processes.

1.1.1. The Status Quo of Primary and Secondary Education Governance

Diversification of subjects is one of the remarkable characteristics of educational governance. Compared with single subject management, different subjects participating in governance have significant advantages because of their diverse advantages and complementary functions [13]. After long-term development, the basic education represented by primary and secondary schools in China has initially realized an important transformation from single-subject government management to diversified governance subjects, and formed a basic education governance system with government, schools and society as the governance subjects. With regard to the relationship and orientation among them, the Ministry of Education issued "Several Opinions on Further Promoting the Separation of Education Management and Administration and Promoting the Transformation of Government Functions" in 2015, which clearly defined the roles of promoting the separation of education management and administration and promoting the transformation of government functions, and also clearly defined the governance roles of schools and society, namely, the government manages according to law, schools run independently according to law, and all sectors of society participate and supervise according to law. Although China has made great efforts and made some achievements in the separation of management and evaluation of basic education governance, the separation of management and evaluation at this stage is still superficial, failing to touch on the deep-seated reasons, and facing the dilemma of "the government is too strong, the schools are not independent enough, and the educational evaluators are confused" [14,15]. In this regard, in 2020, the Ministry of Education and other departments jointly issued "Several Opinions on Further Stimulating the Vitality of Running Schools", proposing to deepen the "streamline administration, delegate power, strengthen regulation and improve services" reform of education, implement the autonomy of running schools in primary and secondary schools, enhance the endogenous motivation of running schools, improve the support and guarantee ability of running schools, and improve the management mechanism of running schools. Focusing on solving the outstanding problems such as too much management, too much interference and insufficient incentives and guarantees, we have systematically sorted out from the perspective of modernization of educational governance and made systematic arrangements for stimulating the vitality of running schools in primary and secondary schools. On the whole, the current governance system of primary and secondary education needs to be further transformed from the traditional pattern of centralized power and government-led to the modern pattern of institutionalization, democratization and legalization, and the governance ability needs to be transformed from the low-level governance based on experience to the intelligent modern governance driven by data [16].

1.1.2. The New Connotation of Multi-Collaborative Governance of Primary and Secondary Schools in the Future in the AI Era

The AI technology revolution represented by deep learning has profoundly affected all aspects of human society, and the application of technologies such as Internet of Things, big data, cloud computing and blockchain in the field of basic education has also greatly changed the society's understanding and cognition of basic education. The education governance system in the AI era is also undergoing profound changes. In the future, the governance subjects of basic education schools will expand from natural persons such as government, schools and society to intelligent machines, reconstruct the relationship between the subjects of education governance, and realize a new type of education governance in the form of "man-machine collaboration" [17]. Compared with the

traditional education governance system, human-computer collaborative education governance has obvious advantages, which are mainly reflected in the following three aspects: as the main body of governance, intelligent machines are objective, and their decision-making is not transferred by human will, and is less affected by social rules and environmental factors; Intelligent machine governance is comprehensive, and with its advantages of mass storage and cloud computing, it will enable its governance behavior to consider all aspects, which is beyond human power; Intelligent machine governance has high efficiency, it can process several complex tasks in parallel at the same time, and complete the decision instantly with its built-in expert system, and form a closed loop through intelligent feedback, keeping the error rate at a very low level. In view of the obvious advantages of the above intelligent machines, intelligent machines will become an inevitable trend in the future as the main body of education governance, and the new human-computer collaborative education governance with intelligent machines participating in governance as its distinctive feature will become an important part of school education management in the future.

1.2. AI Era in the Future New Ways of Governance of Primary and Secondary Education

With the deep integration of all kinds of cutting-edge technologies and education governance in the AI era, new ways and new ideas will emerge in the new education governance system featuring man-machine collaboration, and the difficulty in separating the roles of "management, office and evaluation" in the traditional multi-collaborative governance will also be obviously alleviated.

First of all, the participation of intelligent machines as the main body in the governance of basic education will promote the transformation of the main role of the government. As mentioned above, although the traditional education governance model emphasizes multi-governance, the government should play the role of management according to law, and schools should run schools independently. However, the educational governance system, especially the governance of primary and secondary education, is still centered on the government in practice, and there is absolute authority of the government over schools and strong top-down management. One of the reasons for this phenomenon is that the decision-making of basic education governance is difficult, the responsibility is heavy, and the experience is strong. Public opinion often has high expectations for education governance, and other subjects can hardly bear the serious consequences caused by governance failure. However, the long-term government-led characteristics since the implementation of China's education policy also make the school's independence poor and its governance experience relatively scarce, which leads to the difficulty in the modernization transformation of education governance. The "hard drag" of the government's governance role will inevitably lead to the lack of governance subjects and the chaos of the governance system for a period of time. In the future school education governance with the participation of intelligent machines, the government will realize a smooth change in management mode, from top-down authoritative management to up-and-down intelligent management, that is, the government will no longer make decisions based on experience and directly interfere with school grassroots and front-line governance. With the help of massive data storage and big data analysis technology in the AI era, a large number of educational data with scattered sources and various forms can be systematically and efficiently analyzed, so as to plan educational development more scientifically and rationally. Compared with the existing application scenarios of human-computer interaction and human-computer collaboration such as smart classroom, AI technology participating in education governance is a higher level of human-computer collaboration for future education governance. The deep integration of AI technology and government governance decision-making in the future will help to reduce the government's intervention in school grass-roots affairs, avoid the government's excessive participation in decision-making, help the government to play a more guiding role, and finally complete the transformation of the main role.

Secondly, the participation of intelligent machines as the main body in basic education governance will enhance the independence of running schools. The independence of running a school and government intervention management are actually two sides of a whole. In the traditional educational governance system, although the school has a nominal central position, it is often not independent enough in practice and passively obeys the management of the government education department. Because the school has been limited by the relevant policies and regulations of governments at all levels for a long time in the process of running a school, its subjective initiative has not been brought into play, and its ability to run a school has gradually degenerated and lost, forming a vicious circle. In addition, schools in different regions, at different levels and at different stages have their own characteristics in running schools and management, and the overall governance policy issued by the government may be unacceptable in the specific implementation process, resulting in inefficient educational governance and waste of social resources. The participation of intelligent machines in the AI era will significantly improve the above situation. In addition to the transformation of government management methods, school management is no longer completely dependent on the management experience accumulated by managers themselves, and rich educational governance cases can quickly complete the training of managers in a short period of time. At the same time, the AI system will also fully combine the school's own school-running characteristics to formulate personalized school-running plans, thus enhancing the scientificity and rationality of the school's independent decision-making, and ultimately assisting the school to complete its independent school-running transformation.

Third, the participation of intelligent machines as the main body in basic education governance will expand social participation. In the traditional education governance system, many stakeholders in education governance, including students' parents, teaching and training institutions, news media and so on, can be regarded as social subjects, and these subjects play an important role in supervising and evaluating the process and results of education governance. However, due to the opaque decision-making process, the lack of information authenticity, and the weak awareness of public participation in education governance, the social supervision and evaluation function is weak. Take the parent group of students, the social subject most closely related to education governance, as an example. Although this group attaches great importance to their children's basic education, in the practice of education governance, they are often passive recipients of relevant policies and regulations, and they are at the end of the whole process of education governance, and the opportunity to participate in the formulation of education policies is almost zero. A few parents who are enthusiastic about educational governance only give feedback and suggestions on policies concerning their children, but because of their weak voices, their influence on the formulation and implementation of policies is very limited. In the future basic education governance, AI system and man-machine collaborative governance will significantly improve the above situation. China's mobile Internet revolution in recent ten years has successfully delivered smart phones to thousands of households, and completed the "new digital infrastructure". With the systematic construction of public-oriented education governance, in the future school education governance system, the formulation and implementation process of education policies will become more transparent, and a large number of education policies will be followed up and interpreted by the media to achieve popularization. Ordinary people and various social subjects will have more opportunities to participate in education governance, and finally the most concerned issues of the people will be fed back to the government and schools, thus expanding social participation.

2. Current Problems and Multi-Subject Cooperative Governance of Basic Education

With the continuous development of information technology, the management mode and governance structure of basic education schools are also constantly adjusted. In the past, it was difficult to fully adapt to the actual needs of the current school development

by relying on administrative promotion, empirical judgment and hierarchical management. This paper discusses the main relationship and operation mechanism in school governance of basic education, and holds that in the future, school governance should pay more attention to the coordination among the government, schools, society and other forces, and form a more reasonable governance structure on the basis of clarifying their respective responsibilities. At present, although the governance of basic education has gradually changed from single subject management to multiple participation, there are still some problems in actual operation, such as too detailed government responsibilities, insufficient autonomy of schools, limited channels for social participation, etc. These problems have affected the governance efficiency and the initiative of schools' own development to some extent.

From the perspective of governance relationship, the government, schools and society are not separated subjects, but should form a mutually cooperative and complementary relationship under the institutional framework. The government needs to gradually withdraw from the management of specific affairs and focus more on system construction, policy guidance, resource allocation and supervision and guarantee. Schools should further enhance their ability to run schools independently, improve their internal management mechanism according to their actual conditions, and improve the pertinence and effectiveness of decision-making; Parents, social organizations and other stakeholders should also get more stable and smooth channels of participation, so that they can play a more active role in school governance, educational evaluation and policy feedback. Only by forming a clear boundary between different subjects can we avoid overlapping responsibilities, excessive management and insufficient participation.

3. Digital Empowerment and Future Optimization of School Governance

At the same time, the wide application of digital tools also provides new conditions for the governance of basic education. With the help of data platform, schools can know the actual situation in the process of teaching operation, resource use and management in time, and provide more sufficient information support for decision-making. However, technical means cannot solve all governance problems by themselves, and its role still depends on whether the system is perfect, whether the responsibilities are clear and whether the use methods are reasonable. In the future, the focus of school governance in basic education should not be simply on the pursuit of technological renewal, but should pay more attention to the improvement of the governance mechanism itself and combine the application of technology with the actual needs of schools. Through the transformation of government functions, the improvement of school autonomy, the improvement of social participation mechanism and the rational use of information resources, a more open, coordinated and efficient governance pattern can be gradually formed, thus promoting the continuous improvement of the management level of basic education schools.

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