

AI-enabled The Reform of Teacher Management and Evaluation

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Abstract

Under the background of current education reform, teacher evaluation, as a key link to motivate teachers' enthusiasm and improve the quality of education, has important practical significance. Artificial intelligence (AI) technology plays an important role in improving the fairness and accuracy of the evaluation process and also achieves real-time monitoring and dynamic feedback of the evaluation through big data analysis and intelligent algorithms. In addition, artificial intelligence provides more scientific support for the personalized development of teachers, so that teachers can obtain more targeted growth plans according to individual differences, and promote professional and modern developments. Through AI technology, teacher evaluation is no longer limited to static evaluation, but to process evaluation, value-added evaluation comprehensive evaluation, and other multi-dimensional expansion, which promotes the reform of the teacher management model, and enhances the scientific and objective evaluation. Therefore, this paper will focus on the new requirements for teacher evaluation and management in the current age of AI, and deeply explore the practical path of AI-enabled teacher management and evaluation reform.

Keywords

Teacher management and evaluation, Construction of teachers, Artificial intelligence, Teacher evaluation reform.

1. Introduction

Education is the foundation of a nation's long-term development, and within education, teachers are the cornerstone. As the core of the education system, the quality of the teaching workforce directly impacts the level of educational development and the effectiveness of talent cultivation. A key issue in educational management is how to effectively manage and evaluate teachers to stimulate their enthusiasm and creativity. Teacher management and evaluation serve as a "guiding force" for regulating educational quality and determining the overall direction and efficiency of teacher development.

In 2018, the Central Committee of the Communist Party of China and the State Council issued the "Opinions on Deepening the Reform of Teacher Workforce Construction in the New Era" [1], which explicitly stated that "teachers should actively adapt to new technological changes such as information technology and artificial intelligence, and effectively carry out education and teaching." This directive sets the direction for teacher management and evaluation in the new era. With the rapid development of information technology and artificial intelligence, the education sector has ushered in an opportunity for the deep integration of "education + artificial intelligence." In this context, pilot actions aimed at empowering teacher workforce development with AI have gradually begun, to enhance the scientific, effective, and precise management of teachers through intelligent technologies.

By leveraging AI to optimize teacher management, it is not only possible to fully understand the laws and characteristics of teacher growth during the evaluation process but also to use big

data analytics and intelligent algorithms to refine evaluation standards and construct a more scientific and rational evaluation system. Traditional evaluation models tend to be static, with single evaluation criteria that fail to comprehensively reflect teachers' individual differences and diverse capabilities. In contrast, AI can drive innovation in evaluation mechanisms, making them more flexible and dynamic. It can also provide personalized assessments in line with teachers' professional development trajectories, encouraging teachers to fully realize their potential in teaching, research, and innovation. Through continuous optimization of evaluation methods, AI technology will help foster a more professional and modernized teaching workforce, thereby improving the overall quality and competitiveness of education [2][3].

2. Problems in Current Teacher Management and Evaluation

2.1. Lack of Teacher Autonomy

Teachers, as the core force in talent cultivation, bear multiple responsibilities, including education and teaching, scientific research, and social service. They are not only transmitters of knowledge but also drivers of innovative research and contributors to social development. However, with the increasing complexity and diversification of their tasks, teachers often face heavy workloads and significant psychological pressure. This high-intensity work environment can lead to teacher burnout, emotional distress, and even a decline in work enthusiasm and teaching quality. Prolonged exposure to such conditions not only weakens teachers' innovation and creativity but may also result in decreased work efficiency, severely affecting their professional development and the overall level of education.

At the same time, teachers, as the subjects of evaluation, lack a sense of involvement in the evaluation mechanisms and standards. In the current management and evaluation system, teachers often have no effective channels through which to express their personal interests and concerns, thus passively accepting external evaluation results. The one-way nature of the evaluation mechanism, coupled with teachers' insufficient autonomy in the evaluation process, results in a lack of full recognition of their own value and contributions when facing evaluations. This evaluation model not only fails to inspire teachers' intrinsic potential but may also exacerbate their psychological burden, further affecting their enthusiasm and effectiveness in teaching and research.

Therefore, in the reform of teacher management and evaluation, a key issue is how to grant teachers greater autonomy, enabling them to actively participate in the development of evaluation standards and the feedback process. This is crucial for enhancing teachers' professional well-being and teaching enthusiasm. By constructing a more open, transparent, and flexible evaluation system, teachers can demonstrate their professional abilities and potential in a fair and just environment, thereby truly realizing the motivating and growth-promoting functions of evaluation.

2.2. Ambiguity in Evaluation Criteria

The current teacher management and evaluation methods remain relatively simplistic, lacking a multi-dimensional and multi-level evaluation system. This results in insufficient systematicity and stability in evaluation standards, making it difficult to accommodate the diverse professional characteristics and development needs of different types of teachers. Within universities, there is a wide range of academic disciplines, and teachers' roles vary significantly, encompassing areas such as teaching, research, administrative management, and technical support. Teachers' responsibilities may differ within the same discipline or position due to varying emphases—some focus on basic research, while others are more oriented toward applied research. Similarly, the work content of administrative staff and technical support personnel also exhibits considerable differences. However, the existing evaluation mechanisms

lack a classification framework to address these differences and fail to tailor evaluation standards to the specific duties of each role.

This "one-size-fits-all" approach to evaluation leads to uniform assessments of different types of talent under the same standard, which fails to comprehensively and accurately reflect the contributions and capabilities of various teachers [4]. Due to the blurred boundaries of evaluation criteria, the results often fail to genuinely reflect a teacher's strengths and the actual value of their role, thereby affecting the fairness and motivational power of the evaluation. Moreover, this lack of targeted evaluation not only hinders the personalized development of different types of teachers but may also, to some extent, limit their work enthusiasm and innovative potential. Therefore, there is an urgent need to establish a more detailed and systematic classification-based evaluation system that differentiates assessments according to teachers' roles, responsibilities, and disciplinary characteristics to enhance the scientific and fair nature of evaluations and achieve the sustainable development of the teaching workforce.

2.3. Questionable Fairness of Evaluation Results

The current evaluation standards for teachers often suffer from ambiguity or insufficient coverage, making it difficult to fully reflect teachers' overall performance in teaching, research, and service. These vague or imprecise evaluation criteria make it challenging to fairly and justly assess teachers' performance across different dimensions. In addition, the existing feedback mechanisms for teacher assessments are underdeveloped, lacking clear reinforcement feedback and incentive measures. As a result, teachers receive little effective guidance and support after evaluations, limiting the positive motivational effects that evaluations should ideally produce. The lack of transparency in the evaluation process further intensifies teachers' skepticism about the fairness of evaluation results, especially when the evaluation process and standards are not made public. Teachers are then unable to understand the specific criteria and basis for evaluating their performance.

More critically, subjectivity often interferes with the teacher evaluation process. Personal biases, emotional factors, or other non-professional considerations by evaluators can, in certain cases, influence the fairness of the evaluation results. These subjective factors not only have the potential to distort the evaluation outcomes but can also undermine the credibility and public trust in the evaluation system. When teachers cannot be confident in the objectivity and fairness of the evaluation process, their professional enthusiasm and motivation may be negatively impacted. In summary, the lack of clarity in evaluation standards, the inadequacy of feedback mechanisms, and the influence of subjective factors all contribute, to varying degrees, to the erosion of fairness and accuracy in teacher evaluations. This, in turn, weakens the effectiveness of the evaluation system and hampers the overall development of the teaching workforce [5].

2.4. Limited Effectiveness of Evaluation as a Guiding Mechanism

In the current teacher management and evaluation system, the goals, methods, standards, and outcomes of evaluation often lack flexibility and relevance. The system tends to educational administration, with evaluation methods often being overly rigid, making it difficult to fully capture teachers' multifaceted performance in teaching, research, and other professional duties. In particular, the focus of evaluation criteria has been overly concentrated on research achievements, with an excessive emphasis on the quantity of published articles. This results in an evaluation system that is too narrow, overlooking crucial aspects such as teaching quality, classroom interaction, and educational practice. These biased evaluation standards not only fail to measure teachers' actual contributions comprehensively but also weaken the attention teachers devote to teaching [6].

Furthermore, the teacher management and evaluation system has not adequately taken into account individual differences among teachers and the evolving needs of diverse educational environments. This results in a lack of universality and specificity in the evaluation process. The one-size-fits-all approach and lack of flexibility in evaluation standards are insufficient to accommodate the diversity of teaching contexts, meaning that teachers' true performance often goes unrecognized or misrepresented.

More critically, the feedback mechanism for evaluation results is underdeveloped, with feedback often being delayed or vague, and a lack of clear, actionable guidance following evaluations. This delay and lack of clarity in feedback diminishes the ability of the evaluation system to promote teacher development. Teachers do not receive effective suggestions for improvement after evaluations, preventing them from enhancing their teaching effectiveness based on feedback. As a result, the positive motivational effects of evaluations are not fully realized, and the overall efficacy of the teacher management and evaluation system is compromised, hindering improvements in teachers' professional skills and teaching quality.

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3.1. Changes in the Educational Ecological Environment

In the age of intelligence, teacher workforce development faces unprecedented opportunities and challenges. While teachers' abilities in emotional understanding, creativity, and educational guidance remain irreplaceable by artificial intelligence, they must nonetheless master and skillfully utilize emerging educational technologies, such as AI-assisted teaching systems and online learning platforms. The widespread application of these technologies places higher demands on teachers' technical literacy. Particularly in AI-powered personalized instruction, teachers not only need to be proficient in using these technological tools but also

must learn how to employ them to implement differentiated teaching approaches, providing personalized learning solutions tailored to the diverse needs of students. Teachers must adapt to the shift from traditional "one-to-many" teaching models to more individualized approaches, such as "one-to-one" or "small-group" instruction. This requires teachers to focus more on fostering students' self-directed learning, creative thinking, and exploratory abilities. To achieve this, teachers' professional development must keep pace with technological advancements, continuously engaging in training and further education to adapt to the ever-evolving educational technologies and teaching philosophies. Only by doing so can they maintain their competitiveness and creativity in the new educational environment.

3.2. Diversification of Teacher Evaluation

With the gradual reform of teacher management and evaluation systems, the stakeholders involved in teacher evaluation have become increasingly diverse. In addition to traditional internal administrative bodies, peers within and outside the institution, third-party evaluation agencies, and students have also emerged as important participants in the evaluation process. However, this diversification of evaluators can lead to the influence of emotional factors, personal biases, and other external disturbances, which may compromise the fairness of the evaluation. The introduction of artificial intelligence (AI) provides an effective solution to this issue. AI technology can reduce human intervention through big data analysis, minimizing the impact of administrative power and personal relationships on teacher evaluations, thereby ensuring a more objective and transparent evaluation process. Furthermore, AI can conduct data-driven analyses of teachers' teaching effectiveness and research achievements, significantly enhancing the professionalism, objectivity, and credibility of the evaluation results. Empowered by AI, teacher evaluation moves beyond reliance on singular subjective assessments and utilizes multidimensional data for cross-validation, thus enabling a more fair and comprehensive evaluation.

3.3. The Need to Enhance the Scientific Basis of Teacher Evaluation Reform

Although the application of artificial intelligence (AI) in education offers numerous advantages for teacher evaluation, ensuring the protection of teacher data privacy, preventing the misuse of technology, and maintaining the scientific integrity of evaluation decisions have become critical issues. AI technologies demonstrate significant efficiencies in data collection and precision in data analysis, far surpassing traditional methods of evaluation and management. However, the potential risks of privacy breaches and data misuse must not be overlooked. Therefore, as AI technology is increasingly integrated into teacher evaluation processes, it is essential to establish appropriate privacy protection policies and ethical guidelines to ensure that AI applications are transparent, lawful, and ethically sound. At the same time, the use of AI can enhance the precision and objectivity of teacher management, effectively reducing human bias and improving the scientific nature of management decisions. By deeply analyzing various types of teacher data, AI can provide personalized development recommendations for teachers and assist educational administrators in making more scientifically grounded management decisions, thereby promoting the overall development of the teaching workforce.

4. Pathways for AI-Driven Reform in Teacher Evaluation and Development

Artificial intelligence holds immense potential to advance the development of teacher teams, and its strategic application can address many challenges in teacher workforce management. The "General Plan for Deepening the Reform of Education Evaluation in the New Era," issued by the Central Committee of the Communist Party of China and the State Council, explicitly states the need to "improve outcome-based evaluations, strengthen process evaluations, explore value-added evaluations, and establish a comprehensive evaluation system. The plan

emphasizes fully utilizing information technology to enhance the scientific, professional, and objective nature of educational evaluations" [10].

AI-enabled teacher education evaluation is based on the application of intelligent technologies in teacher assessments and has emerged as a new model and form of smart education driven by the rapid development of artificial intelligence, big data, and other intelligent technologies in recent years. By leveraging AI to build a robust teacher evaluation system, the role of evaluation stakeholders can be maximized, evaluation methods can be innovated, and dynamic evaluation data can be continuously collected. This will provide decision-making support for teacher assessments, ultimately empowering the reform and construction of teacher evaluation systems [11][12][13].

4.1. Enhancing the Role of Evaluation Stakeholders to Ensure the Reliability of Educational Evaluation Outcomes

As key stakeholders in the evaluation process, teachers can directly participate in the reform of teacher evaluations through the use of AI, thereby improving the effectiveness and authenticity of the assessment. Additionally, the involvement of students in the evaluation process enhances the practical impact and reliability of educational assessments. With the empowerment of AI, teacher management departments can comprehensively evaluate educators. AI can assist administrators in tracking changes in educational policies and regulations, ensuring the compliance of teacher management and evaluation systems, and updating relevant processes accordingly.

4.2. Innovating Evaluation Methods to Enhance the Objectivity of Evaluation Results

By fully utilizing AI technologies such as Augmented Reality (AR) and Virtual Reality (VR), a "human-machine-human" interactive teacher evaluation system can be established, which effectively enhances the comprehensiveness and objectivity of the assessment. AI technologies allow for the real-time collection and analysis of multi-dimensional data, including teachers' teaching behaviors, classroom quality, and student feedback, thereby creating a more scientific evaluation mechanism. This technology-driven evaluation system not only accurately assesses teaching effectiveness but also provides personalized development recommendations for each teacher, aiding in the enhancement of their skills and teaching performance[14].

Furthermore, AI's powerful data analytics capabilities enable the identification of patterns and trends within the teaching process, helping to pinpoint successful teaching practices and areas needing improvement. Through the processing and analysis of large volumes of data, AI offers reliable decision-making support for educational administrators, assisting them in adjusting management policies and procedures based on teachers' actual performance, and optimizing the teacher management system. By integrating self-assessments with external evaluations, AI also helps to consolidate fragmented and dispersed evaluation data into a systematic and comprehensive evaluation framework, further improving the integrity and objectivity of the evaluation outcomes.

Based on AI-driven data analysis, educational administrators can also design fairer, more transparent, and incentivize teacher reward systems, recognizing and motivating outstanding teachers. This data-driven reward mechanism not only boosts teachers' work enthusiasm but also encourages continuous innovation in teaching, ultimately contributing to the overall improvement of educational quality.

4.3. Providing Decision-Making Support for Precision in Evaluation Results

To effectively advance the application of artificial intelligence (AI) in teacher evaluation and reform, it is essential to create a conducive smart education ecosystem. AI technologies can assist in resolving various complex issues within the teacher evaluation reform process, such

as the formulation and optimization of evaluation content, as well as ensuring the fairness and scientific rigor of evaluation results. Specifically, by employing intelligent algorithms like artificial neural networks, AI can conduct in-depth analysis of multi-dimensional data in the teacher management system, thereby achieving intelligent, comprehensive evaluation. This technological empowerment not only improves the accuracy and efficiency of the evaluation process but also lays the foundation for the scientific development of the teacher evaluation system.

During the teacher evaluation process, AI can analyze and diagnose teachers' professional capabilities by mining evaluation data in combination with a well-established set of evaluation criteria, generating detailed assessment reports. These reports provide a comprehensive reflection of a teacher's performance in teaching, research, and other areas, assisting administrators in understanding the overall competence level of the teaching staff, as well as identifying individual strengths and areas for improvement. Based on this data, administrators can make more precise decisions and adjust the management and evaluation system to better align with teachers' developmental needs.

Moreover, AI not only provides decision-making support for administrators but also helps teachers pinpoint key areas for their professional development. By analyzing the dynamics of teachers' ability growth, AI can offer personalized career development recommendations, guiding teachers in identifying their future development trajectories and areas for improvement. This intelligent analysis and feedback mechanism effectively promotes the enhancement of teachers' professional abilities, thereby driving the continuous improvement of the teacher evaluation system.

4.4. Improving the Evaluation System and Promoting Teacher Development

The reform of teacher management and evaluation should fully leverage the advantages of artificial intelligence (AI), introducing various evaluation methods such as peer evaluation, student evaluation, and self-assessment, to create a multi-dimensional and comprehensive evaluation system. This system should be based on a diverse evaluation mechanism that encompasses all aspects of the evaluation process. By utilizing various data collection terminals, the evaluation of teachers should be conducted in a holistic, continuous, inclusive, and non-interfering manner. The development of intelligent assessment systems, using machine learning algorithms, can automatically assess aspects such as teaching design, classroom interaction, and assignment grading, reducing human bias and enhancing the fairness of evaluations.

Empowered by technology, the goal is to establish a fairer, more rational, and motivating teacher management and evaluation system, providing comprehensive, multi-layered support and assessment for teachers. This approach will elevate the overall effectiveness and quality of the education system, fostering a highly qualified, professional, and innovative teacher workforce[15].

5. Conclusion

In summary, AI plays a crucial role in advancing the reform and development of teacher evaluation. By incorporating intelligent technologies, AI provides scientific decision-making support, significantly improving the objectivity and fairness of evaluation results. AI technologies can deeply analyze multi-dimensional data, ensuring that the evaluation process is transparent and accurate, while effectively involving various evaluation stakeholders, including administrative bodies, peers, and students. Moreover, the application of AI fosters continuous innovation in teacher evaluation methods. Through the introduction of data-driven,

intelligent evaluation systems, a fair, reasonable, and incentivizing teacher management and evaluation system has been established.

The integration of AI technologies into the development of the teaching workforce strengthens the scientific management of teachers and further refines the teacher evaluation mechanism. This intelligent reform not only enhances management efficiency but also provides teachers with more personalized feedback and guidance, fostering their professional growth. As AI continues to deeply integrate with teacher management systems, the reform of teacher evaluation and management is progressively becoming more scientific, professional, and modernized, thereby laying a solid foundation for improving educational quality and the overall quality of the teaching workforce. Looking ahead, AI will continue to play an important role in teacher workforce development, driving sustained innovation and progress in the education sector.

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References

- [1] Central Government of the People's Republic of China. Opinions of the CPC Central Committee and The State Council on Comprehensively Deepening the Reform of the Construction of Teachers in the New Era.
Information on: http://www.gov.cn/zhengce/2018-01/31/content_5262659.htm.
- [2] Ministry of Education of the People's Republic of China. The guiding opinions of the Ministry of Education on deepening the reform of the evaluation system for college teachers.
Information on: http://www.moe.gov.cn/srcsite/A10/s7151/201609/t20160920_281586.html.
- [3] Peng Jing, WU Nan-zhong. Artificial Intelligence Empowering Integrated Development of Teachers: Logical Framework and Pathways [J]. Modern education technology, 2024, 34(10): 23-31.
- [4] Central Government of the People's Republic of China. CPC Central Committee Issues Opinions on Deepening the Reform of the System and Mechanism for Talent Development.
Information on: http://www.gov.cn/zhengce/2016-03/21/content_5056113.htm.
- [5] ZeweiZhang. Difficulties and Reform Suggestions of University Teachers' Evaluation—From the Perspective of Humanistic Management Theory [J]. Shanghai Journal of Educational Evaluation, 2022, 11(1): 36-40.
- [6] LijiangLv, Wu Jian. Analysis on the Reform of Faculty Evaluation System in Universities' Construction in the New Era [J]. Zhejiang social sciences, 2021(7): 144-149.
- [7] Wang, Wei and Wang, Guangming and Ding, Xiaoming and Zhang, Baoju. Artificial Intelligence in Education and Teaching Assessment [M], 2021, Springer.
- [8] MengxingLiu, HongxiaZhang. Problems, trends and reform strategies of scientific research evaluation in colleges and universities [J]. Journal of Higher Education Management, 2021, 15(1): 117-124.
- [9] Wang Bin, Chen Jiang. Research on the reform of college teachers' evaluation mechanism under the background of breaking the "Five Only" [J]. Accounting newsletter, 2023(19): 171-176.
- [10] The CPC Central Committee and The State Council. Overall plan for deepening the reform of educational evaluation in the new era.

Information on: https://www.gov.cn/zhengce/2020-10/13/content_5551032.htm

- [11] ZhizhenZhang, WenxinOi. Information technology in educational Challenges assessment: empowerment, and solutions [J]. Distance education in China, 2021(3): 1-12.
- [12] Congratulatory letter to International Conference on Artificial Intelligence and Education. Information on: https://www.gov.cn/xinwen/2019-05/16/content_5392134.htm.
- [13] Sperling K, Stenberg C J, McGrath C, et al. In search of artificial intelligence (AI) literacy in Teacher Education: A scoping review[J]. Computers and Education Open, 2024: 100169.
- [14] Alper A. Evaluating the evaluators: A comparative study of AI and teacher assessments in Higher Education[J]. Digital Education Review, 2024 (45): 124-140.
- [15] Chen Liang, Evaluation of High-quality Teacher Education: Connotation Characteristics, Logical Structure and Promotion Strategies[J]. Journal of Shaanxi Normal University (Philosophy and Social Sciences Edition) ,2022(6): 25-35.