



The 20th National and International Conference
"Strengthen knowledge to drive education and integrate across sciences for sustainable development"
December 3, 2025 Online Via Zoom

THE IMPACT OF GENERATIVE ARTIFICIAL INTELLIGENCE ON TEACHER LEADERSHIP IN CHINESE VOCATIONAL EDUCATION

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Abstract

By reviewing the development of generative artificial intelligence in education and the evolution of teacher leadership, the paper clarifies the connection between generative artificial intelligence and teacher leadership. Teacher leadership is not confined to any particular administrative title but to a set of functional behaviors and related initiatives. Generative artificial intelligence can promote teacher leadership in areas such as teaching innovation, organizational coordination, and cooperation between school and enterprise. Concurrently, algorithm dependence, ethical ambiguity, and digital inequality also increase the risks of applying generative artificial intelligence in education. By exploring the impact of generative artificial intelligence on the leadership of vocational education teachers, this paper provides some references on how to enhance teacher leadership in the era of artificial intelligence and promote the reform of vocational education.

Keyword: Generative Artificial Intelligence, Teacher Leadership, Vocational Education

Introduction

The rapid advance of artificial intelligence (AI) is transforming education systems worldwide; International organizations such as UNESCO also underscore that AI is indeed one of the key drivers to achieving Sustainable Development Goals (SDGs), most notably through SDG 4 which relates to quality education (UNESCO, 2021). It calls for deep integration of AI into education so as to create innovative teaching and learning environments as well as open and flexible systems of education supported by AI (UNESCO, 2019).

Policies have been introduced in China that accelerates the application of AI in its educational system so as to spur innovation as well as foster educational reform (Ministry of Education of the People's Republic of China, 2018; The State Council of the People's Republic of China, 2017). In vocational education, teachers bridge teaching with industry and technology while their leadership plays an influential role in determining the process by which they are digitized (Xu et al., 2024). The entry of generative AI in the vocational classroom offers unique opportunities to strengthen teacher leadership in the process of their digital transformation through the promotion of their autonomy and innovation, yet limitations abound with respect to its impact on teacher leadership that still remain largely unexplored.

This paper is going to investigate the current status of AI application to clarify how



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artificial intelligence empowers teachers and enhances their leadership roles, analyze key existing challenges, and provide valuable insights for educators and policymakers in leveraging AI to advance educational development.

Applications of Generative Artificial Intelligence in education

The Connotation of Generative Artificial Intelligence

Artificial intelligence is a multidisciplinary field within computer science. It enables machines to simulate human intelligent behaviors for environmental perception, reasoning and decision-making, learning new knowledge, and performing complex tasks (Hasanah et al., 2025; UNESCO, 2021). Generative Artificial Intelligence often known just as GenAI or GAI is a branch of AI that draws heavily on generative models like Large Language Models or Generative Adversarial Networks (Mukhin et al., 2025). These models generate entirely new content like text, images, video or sound recording based on patterns learnt from training data based out (Aad & Hardey, 2025). The most widely used generative AI systems include ChatGPT, Copilot, and AI-based lesson planning tools. In education, these tools help teachers create content, design assessments, and provide personalized feedback (Ghamrawi et al., 2024).

The Role of Generative Artificial Intelligence in Education

Generative artificial intelligence (GAI) in education is growing in response to teaching needs, advances in technology, and supportive policies. COVID-19 has sped up the adoption of AI in education. Educational stakeholders are now more open to using generative AI. They apply it to support lesson planning, automate assessments, provide real-time feedback, and promote both collaborative and problem-based learning for students (Bond et al., 2021; Zawacki-Richter et al., 2019). At the same time new AI policies and strategies have been deployed to promote AI applications in education while UNESCO issues strategic documents for guidance to ensure that generative AI applications in education are equitable, safe, and responsible (UNESCO, 2023). Ministry of Education of the People's Republic of China (2025) stresses the importance of integrating digital and artificial intelligence technologies in innovative ways. The goal is to strengthen teachers' ability to adapt to and lead the transformation toward intelligent education.

From the emergence of ChatGPT to the technological breakthrough of Sora, generative artificial intelligence (GAI) is leading vocational education toward informatization, digitalization, and intelligent transformation (Wang et al., 2025). Artificial intelligence is no longer viewed as a futuristic concept but as an integral component of educational modernization. Together, these developments signal not only the rapid expansion of GAI tools in educational contexts, but also their growing institutional legitimacy and long-term transformative potential.

Teacher Leadership

Teacher Leadership and Teacher Leader: Conceptual Distinction

Teacher leaders are, first and foremost, expert teachers who will spend the majority of their time in the classroom, but also take on different leadership roles at different times, they make an impact and drive educational improvement within and beyond the classroom



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(Katzenmeyer & Moller, 2009; Silins & Mulford, 2002). But Teacher leadership refers to teachers' ability to influence their peers, shape school culture, and participate in instructional and organizational development without necessarily holding formal administrative positions (York-Barr & Duke, 2004).

In summary, teacher leadership is widely conceptualized as a professional function rather than a positional attribute. That is, it does not inherently depend on formal titles, designated roles, or hierarchical authority within the school structure.

The Evolution and Transformation of Teacher Leadership

Early conceptualizations positioned teachers as “change agents”, highlighting their critical role in driving and sustaining school reform (Lieberman & Miller, 1984). In the late 20th century, the introduction of the Role-Function Model acknowledged that certain teachers may occupy formal positions, thereby embodying a dual identity that integrates both formal authority and informal influence (Katzenmeyer & Moller, 2009). The subsequent emergence of distributed leadership theory redefined leadership as a de-positionalized, collective practice enacted by multiple actors within educational organizations (Gronn, 2002; Spillane & Camburn, 2006). The three-dimensional model delineated the core domains of teacher leadership as instructional leadership, organizational leadership, and professional community leadership, emphasizing teachers' capacity to coordinate and influence beyond the classroom (York-Barr & Duke, 2004). Five Features of Teacher Leadership Framework proposes that teacher leadership behaviors should simultaneously possess the following five core characteristics: Student-Centered, Action-Oriented, Beyond One Classroom, Positive Influence, and Collaborative (Hunzicker, 2022).

In the contemporary era, characterized by the proliferation of artificial intelligence, big data, and digital technologies, teachers increasingly leverage technological tools to enhance their contributions to instruction, assessment, and institutional management. Consequently, technological competence has been incorporated as an essential component in emerging teacher leadership practice frameworks (Bekiaridis, 2024; UNESCO, 2021).

The Potential of Generative Artificial Intelligence in Teacher Leadership

Enhancing Professional Development of Teacher

Unlike traditional AI, which focuses on prediction and automation, Generative artificial intelligence emphasizes content creation, linguistic structuring, and human-AI collaboration. Vocational teachers can utilize generative artificial intelligence to efficiently generate lesson plans, instructional cases, formative assessments, research outlines, and reflective journals, thereby saving cognitive resources for more complex decision-making and pedagogical innovation (Zawacki-Richter et al., 2019). Moreover, generative artificial intelligence serves as a scaffolding tool for novice teachers by providing stylistic and structural models for academic and instructional writing. This strengthens their professional authority and mentoring capacity within teaching teams and subject groups.

Advancing Organizational and Strategic Leadership

In vocational education, teachers often serve as key agents in school–enterprise collaboration, project coordination, and policy implementation. Teachers can use Generative



artificial intelligence tools to draft initial plans for school-enterprise cooperation, build a student competency development map that integrates industry adaptability and educational regularity, and systematically organize and analyze feedback from enterprises on talent cultivation to write analytical reports. This process enhances teachers' professional influence in cross-departmental collaboration. It also helps them transition from traditional teaching roles to becoming participants in education governance with systematic thinking (Liu et al., 2023). Meanwhile, the analytical and language processing tools of generative artificial intelligence enable teachers to obtain more accurate references. This enhances their ability to participate in quality assurance, assessment, and development planning at the school level, and strengthens their role in decision-making processes and organizational change (Zhao & Watterston, 2021).

Enhancing Capacity for Collaboration between School and Enterprise

Generative artificial intelligence has the potential to support teacher leadership in schools and enterprises, a key element of vocational education. By assisting teachers in proposal writing, industry analyses, and multilingual communication materials, it helps teachers lead cross-sector projects with enhanced efficacy and professionalism. It enables data-driven curriculum planning and hybrid human-AI leadership in which teachers' judgment is augmented by AI tools. As such, GAI can empower teachers as instructional leaders and strategic project leaders of school-business collaboration and innovation (Frøsig & Romero, 2024; Ghamrawi et al., 2024).

Challenges of Generative Artificial Intelligence in Teacher Leadership

Diminishing Professional Agency through Algorithmic Dependence

One major concern is that if generative artificial intelligence becomes mainstream in teacher leadership practice, generative artificial intelligence tools may erode teachers' agency over their professional knowledge practices. Over-reliance on GAI tools to plan lessons, align curricula, and produce documentation could lead to a situation where teachers become passive recipients of machine-generated content and critical or reflexive thinking skills might be diminished. This excessive dependence could weaken the leadership identity of teachers in professional learning communities (Frøsig & Romero, 2024). Eventually, instructional authority could slowly shift from teachers to opaque algorithms.

Absence of Institutional Ethical Guidelines and Teacher Training

A broader institutional challenge lies in the lack of comprehensive policies and training regarding ethical and responsible use of generative artificial intelligence in leadership contexts. Viberg et al. (2024) found that many teachers across multiple countries reported limited access to professional development on AI-related topics, including data privacy, copyright law, and algorithmic transparency. This policy gap limits teachers' ability to lead responsibly in digital contexts and may discourage them from participating in school-level decision-making that involves AI. Without clear institutional support, teachers face uncertainty regarding the boundaries of ethical generative artificial intelligence use, which may constrain rather than empower leadership practices.



Digital Divides and Leadership Inequity in the Generative Artificial Intelligence Landscape

Despite expanding technological access in schools and rapidly improving generative artificial intelligence technologies available to users, digital inequalities persist and are more pronounced among underprivileged vocational institutions. These digital divides imply that some teachers develop digital skills more slowly than others and are unable to use the full potential of AI technologies. Teachers in urban schools with sufficient resources might be able to use multilingual GAI tools for global content creation while rural counterparts do not have access or support systems required for such opportunities. This creates a new form of digital inequality in schools which will widen school leadership gaps (Selwyn, 2019). Educational inequalities can occur if unequal access is provided to AI tools and training for teachers where GAI tools become status symbols rather than learning tools.

Conclusion

Generative artificial intelligence (GAI) does not aim to redefine who leads but rather reshapes how teachers exercise leadership in practice. In the field of vocational education, generative artificial intelligence plays a facilitative role in enhancing teacher leadership practices. It expands teachers' leadership functions in educational practice by supporting instructional design, strengthening professional collaboration, and enabling strategic engagement in school-enterprise cooperation. However, issues such as the absence of ethical governance frameworks, increased dependence on algorithms, and unequal access to digital infrastructure may hinder the equitable development of teacher leadership. Subsequent research should focus on constructing AI-integrated leadership practice models that align with educational contexts in the age of artificial intelligence. It should also explore how generative artificial intelligence influences teacher leadership, develop targeted training mechanisms, and reinforce institutional support in order to genuinely empower teachers to exercise professional agency and collaborative leadership.

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