Creative Education, 2025, 16(9), 1476-1484
https://www.scirp.org/journal/ce
ISSN Online: 2151-4771
ISSN Print: 2151-4755

A Study on Professional Development Paths for Vocational College Teachers in the Context of Artificial Intelligence

Jinying Chen

Guangdong Polytechnic of Industry and Commerce, Guangzhou, China
Email: 1316673287@qq.com

How to cite this paper: Chen, J. Y. (2025). A Study on Professional Development Paths for Vocational College Teachers in the Context of Artificial Intelligence. *Creative Education, 16,* 1476-1484.
https://doi.org/10.4236/ce.2025.169087

Received: August 27, 2025
Accepted: September 22, 2025
Published: September 25, 2025

Abstract

The advent of the Artificial Intelligence (AI) era is reshaping the landscape of vocational education with unprecedented breadth and depth. As the core driving force, technology, along with the flow of capital, policy guidance, and the "teaching habits" of individual and collective teachers, forms a complex interactive relationship that collectively influences the trajectory of vocational college teachers' professional development. This study aims to analyze the interplay and integration among technology, capital, and habitus in the context of AI. Building upon this analysis, it constructs a multidimensional development path that integrates human-AI collaboration, curriculum redesign, community building, and the cultivation of a humanistic spirit, with the goal of providing theoretical reference and practical guidance for the professional growth of vocational college teachers in the new era.

Keywords

Artificial Intelligence, Vocational College Teachers, Professional Development, Technological Capital, Habitus, TPACK

1. Introduction: The Challenges of Professional Development for Vocational College Teachers in the AI Era

AI technology, centered on deep learning, big data, and algorithms, is transitioning from an auxiliary tool to a core force for restructuring educational scenarios. In the field of higher vocational education, the application of AI not only alters the way knowledge is imparted but also presents profound challenges to traditional teaching models, teacher roles, and even the teacher-student relationship (Lu & Zhao, 2025). AI technology can enable personalized learning recommenda-

tions and precise analysis of student learning (Tian, 2021). Its efficiency and indefatigability diminish the traditional advantages of teachers in imparting knowledge and resolving doubts, leading to the observation that "artificial intelligence is having a revolutionary impact on education" (Fan, 2020). The transformation of traditional teaching paradigms centered on rote memorization and knowledge acquisition is imminent.

Simultaneously, AI is having a structural impact on the labor market. A large number of repetitive, standardized jobs are being, or will be, automated (Tian, 2021), creating an urgent demand for highly skilled technical professionals who possess advanced cognitive skills, social-behavioral skills, and innovative capabilities. This directly places new demands on the talent cultivation goals of higher vocational education, consequently presenting unprecedented challenges to the professional competencies and qualities of vocational college teachers. Teachers are no longer merely knowledge transmitters; they must upgrade their roles to become "analysts" who understand students, "designers" who reorganize curricula, and "planners" who connect students with the real world. At the same time, the core value of a teacher is increasingly manifested in the unique human qualities that AI cannot replicate, such as emotional care, moral guidance, and the nurturing of life.

However, the rapid iteration of technology does not guarantee a smooth professional development for teachers. On the one hand, the introduction and application of technology require capital investment and support. On the other hand, teachers, as actors with a specific "habitus", may exhibit adaptability, hesitation, or even resistance when confronted with new technologies, due to their long-established educational beliefs, teaching styles, and behavioral patterns.

Therefore, this paper presents a conceptual study that explores the interactive logic among technology, capital, and habitus to understand and plan the professional development path of vocational college teachers in the AI era. The analysis first defines these core concepts and integrates them with the Technological Pedagogical Content Knowledge (TPACK) framework. It then uses this integrated framework to construct and propose a four-dimensional path for professional development.

2. Core Concept Definition and Theoretical Framework

This study adopts Bourdieu's field theory (Bourdieu, 1998) to construct a theoretical framework for teacher professional development based on the interactive relationship among technology, capital, and habitus. It also introduces the Technological Pedagogical Content Knowledge (TPACK) framework as a core tool for analyzing teachers' professional competence.

2.1. The Interactive Logic of Technology, Capital, and Habitus

Technology: In this study, "technology" specifically refers to emerging information technologies represented by AI. It is not merely a teaching tool but an active

force that shapes the educational environment and changes the relationship between teaching and learning. Technological development provides possibilities for educational innovation, but it does not directly determine educational outcomes; it needs to be deeply integrated with the teaching context.

Capital: This refers to capital in a broad sense, including not only the economic capital required for introducing AI technology and building smart campuses, but also social capital such as policy support and institutional guarantees. The flow and allocation of capital directly influence the accessibility and depth of technology application in education, thereby constraining or promoting teachers' professional development.

Habitus: Habitus is a core concept of the sociologist Pierre Bourdieu (Bourdieu, 1998). It refers to a system of lasting, transferable dispositions internalized by an individual through long-term life experiences within a specific social field. It shapes an individual's way of perceiving, thinking, and acting. The habitus of vocational college teachers is the relatively stable set of teaching beliefs, behavioral patterns, and value judgments formed during their careers. When faced with AI technology, a new "external object," teachers' habitus will selectively filter and reconstruct it, thus influencing their acceptance and application of the technology. The complexity of a teacher's habitus stems from the internal conflicts of their multiple social roles. Chen Xiaoyun (2017) argues that teachers often simultaneously play the three roles of "academic person", "political person" and "performance-driven person". The "academic person" seeks pure scholarly inquiry and the art of teaching; the "political person" needs to follow ideological requirements and policy guidance; while the "performance-driven person" must cope with the school's quantitative assessments and promotion pressures, often dominated by research metrics. The tension and conflict among these three roles profoundly shape a teacher's behavioral patterns when facing new technologies: they may adopt technology for utilitarian reasons due to "performance" pressure, use it cautiously due to "political" requirements, or critically examine it from an "academic" ideal. This role conflict is the deep-seated reason why their habitus shows adaptation, hesitation, or resistance in the face of change.

In the field of higher vocational education, technology, capital, and habitus constitute a dynamic system of interplay. The flow of capital determines the entry threshold and promotion of AI technology, which is the "qualification" for teachers to access new technologies. The introduction of technology, as a variable, challenges the existing teaching order. Meanwhile, a teacher's habitus, as a deep-seated behavioral disposition, plays a crucial role in filtering, selecting, and reconstructing the adoption of technology. The mutual constraint and transformation among these three elements collectively shape the present and future possibilities of teacher professional development.

2.2. The Introduction and Expansion of the TPACK Framework

The TPACK theory, proposed by Mishra and Koehler (Mishra & Koehler, 2006),

emphasizes that effectively integrating technology into teaching requires the fusion of three core types of knowledge. Xu & Li (2025) stated that the three core types are: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technology Knowledge (TK). The essence of TPACK is that it is not a simple superposition of these three types of knowledge, but an "emergent knowledge", a new form of knowledge that is generated through the dynamic interaction and transformation of the three core types in a specific context. In the AI era, the connotation of the TPACK framework needs to be further expanded (Yu & Zhang, 2022). Teachers must not only master the operation of general AI tools (TK) but also understand how AI reshapes the representation of disciplinary knowledge (TCK), and how to use AI to create new teaching methodologies (TPK).

3. The Path of Professional Development for Vocational College Teachers in the AI Context

Based on the analysis of the interaction among technology, capital, and habitus, combined with the TPACK framework, this study proposes an integrated professional development path comprising four dimensions.

Therefore, this paper presents a conceptual study that explores the interactive logic among technology, capital, and habitus to understand and plan the professional development path of vocational college teachers in the AI era. The analysis first defines these core concepts and integrates them with the Technological Pedagogical Content Knowledge (TPACK) framework. It then uses this integrated framework to construct and propose a four-dimensional path for professional development.

3.1. Engaging with AI Technology to Achieve Intelligent Human-AI Collaboration

Embracing technology is an inevitable choice for teacher development in the AI era. Teachers need to transform from passive users of technology into intelligent instructional designers who collaborate with AI. Fan Guosheng (2020) even suggests that teachers should be the leaders of human-AI collaboration.

Enhancing Digital Literacy to Bridge the "Application Gap": Currently, the "new digital divide" in teachers' digital literacy between urban and rural areas, as well as across regions, still exists. Vocational colleges should provide systematic training to help teachers master the necessary AI Technology Knowledge (TK). More importantly, they should understand the educational potential and ethical risks behind the technology to avoid its misuse. It is particularly crucial to emphasize that in the AI era, one of the core elements of this digital literacy is data literacy, which is the ability of teachers to analyze, interpret, and evidence-based apply the student learning data generated by AI systems. This is the foundation for achieving precise teaching and personalized guidance.

Scientific Task Allocation to Reshape the Teacher's Role: Teachers should be adept at using AI to handle repetitive, mechanical teaching tasks, such as grading

assignments and analyzing student data. This is essentially a form of "cognitive outsourcing" where some cognitive activities are handed over to external intelligent systems. This allows teachers to dedicate more energy to more creative and emotional work that is difficult for AI to replace. The path of human-AI collaboration is not static but evolves with the increasing intelligence of AI. Yu Shengquan (2019) divides it into four levels: AI as an "agent" for completing repetitive tasks, an "assistant" for information processing, a "teacher" for imparting knowledge and providing exercises, and even a "partner" for co-exploring the unknown and stimulating innovation. Vocational college teachers should actively plan their roles at different levels of collaboration to achieve a leap from passive users to intelligent collaborators. For example, based on the student profiles provided by AI, teachers can provide more precise personalized tutoring, organize more inspiring project-based learning, and conduct deeper value guidance.

Establishing a "Responsible Innovation" Mindset: In the process of collaborating with AI, teachers must adhere to a humanistic spirit and be vigilant against potential ethical risks brought by technology, such as data privacy and algorithmic bias. A teacher's duty is not only as a technology user but also as a guide for responsible innovation, ensuring that technology serves for good and contributes to the holistic development of people.

3.2. Engaging with Real Life to Promote Curriculum System Redesign

The transformation of the work world by AI technology requires higher vocational education to break down traditional disciplinary barriers and implement a systemic redesign of curriculum content and teaching methods. This implies that teachers must possess a cross-disciplinary vision and the capability to organically integrate knowledge and skills from different fields to cultivate students' comprehensive literacy in order to deal with complex problems in the real world.

Restructuring Instructional Content (CK & TCK): Teachers need to have a deep understanding of how AI technology is changing the content and practices of specific professional fields. For example, in manufacturing-related majors, teachers need to integrate cutting-edge content such as smart manufacturing and industrial robots into the curriculum. Finance and trade majors need to introduce new business models like big data analysis and intelligent investment advisory. This requires teachers to have solid disciplinary knowledge (CK) and a profound understanding of how technology impacts their discipline (TCK).

Innovating Teaching Methods (PK & TPK): The traditional teacher-centered lecture model is no longer sufficient for the needs of the era. Teachers should explore new teaching methods such as Project-Based Learning (PBL), blended learning, and the flipped classroom model. They should also introduce real enterprise projects and social problems into the classroom. In this process, teachers need to be adept at using AI tools (such as virtual simulations and online collaboration platforms) to support the implementation of these new teaching methods, thereby

developing a high level of Technological Pedagogical Knowledge (TPK). For instance, in a business management course, an AI simulation tool could generate dynamic market scenarios, allowing students in a PBL setting to test their strategies against a responsive virtual competitor and receive immediate, data-driven feedback on their decisions.

Strengthening General Education and Humanistic Qualities: Faced with the uncertainty brought by AI, humanistic qualities such as critical thinking, complex problem-solving abilities, and communication and collaboration skills are particularly important. "Education is a matter rooted in the heart; it is a communication between hearts" (Fan, 2020). Vocational college teachers need to organically integrate humanistic spirit and general education elements into their professional courses to cultivate students' "soft skills," thus achieving the unity of "nurturing people" and "cultivating talents". This is also a major reason why AI can never fully replace teachers.

3.3. Engaging with the World to Build Teacher Development Communities

A teacher's professional development is a continuous, social process that is difficult to achieve through isolated individual efforts or short-term training. Building multi-level teacher development communities is an effective way to promote their continuous growth.

On-Campus Interdisciplinary Teaching and Research: Break down departmental barriers and establish interdisciplinary AI education application research groups. Teachers from different professional backgrounds can collaboratively discuss AI application cases in their respective fields and share experiences, which can effectively stimulate innovation and promote the integrated development of their TPACK, especially the fusion of PCK (Pedagogical Content Knowledge) and TPK.

School-Enterprise Cooperation and Industry-Education Integration: Through co-building practical bases and developing curriculum resources with leading enterprises in the industry, teachers can directly face the technological changes, and talent demands at the forefront of the industry. This helps them update their disciplinary knowledge (CK) and Technical Knowledge (TK), breaking the barrier between higher education and industry needs. An example would be a partnership between a graphic design program and an AI software firm, where teachers and industry experts co-develop a curriculum module on generative AI for visual media, ensuring students learn current industry-standard tools and ethical considerations.

Online and Offline Learning Communities: Utilize online platforms to build cross-regional and cross-institutional Professional Learning Communities (PLCs). Teachers can share instructional designs, exchange ideas, and collaborate on research within these communities. This continuous peer support and expert guidance is a key mechanism for teachers to reflect on practice and grow through reflection. Such a community can provide teachers with long-term cognitive and

emotional support, helping them overcome the anxiety and loneliness of change and strengthen their confidence in development.

3.4. Facing the Future to Achieve Active Adjustment and Transcendence of Habitus

A teacher's "habitus" is the underlying logic of their professional development. It can either be a barrier to change or, with proper guidance, a driving force for innovation. The key to promoting teachers' professional development lies in guiding them to reflect on and adjust their own habitus.

Establishing a Lifelong Learning Mindset and Internalizing It as a Core Professional Competence: The growth of outstanding teachers is ultimately determined by internal factors. In the era of high-speed technological and knowledge iteration brought by AI, lifelong learning is no longer a personal choice or a good habit, but a fundamental requirement and core quality for teachers to maintain their professionalism and cope with uncertainty. Institutions should establish scientific evaluation and incentive mechanisms to recognize teachers' efforts in instructional innovation and stimulate their intrinsic motivation for lifelong learning.

Advocating for Reflective Practice: Reflection is the bridge that connects experience with growth. The core of a teacher's professional development lies in the continuous generation and deepening of their "practical knowledge". This knowledge is rooted in daily teaching contexts and is often implicitly embedded in a teacher's "habitus" in a "tacit" form. Therefore, "teachers should cultivate the habit of reflecting in action and reflecting on action". Through methods such as writing teaching journals, conducting action research, and participating in peer reviews, they can "make their tacit, individualized practical experience 'explicit' as knowledge that can be shared, communicated, and critiqued". This allows them to consciously adjust and optimize their teaching beliefs and behaviors by examining the gap between their old "habitus" and the demands of the new era. For instance, a teacher might use an AI transcription and sentiment analysis tool to review a recording of their class discussion, reflecting on their questioning patterns and the emotional engagement of students to consciously adjust their pedagogical approach.

Role Model Leadership and Cultural Nurturing: The verbal instruction and personal example of senior role models have a profound impact on the growth of young teachers. Schools should actively discover and publicize outstanding cases of instructional innovation both on and off campus to create a campus culture that encourages exploration, tolerates failure, and supports collaboration. When embracing technology and continuous innovation becomes a new collective "habitus", individual teachers' professional development can receive a continuous stream of cultural nourishment and peer support.

4. Limitations and Future Research

This study provides a theoretical framework and conceptual paths for the profes-

sional development of vocational teachers in the AI context. As a conceptual paper, its primary limitation is the absence of empirical validation. The proposed paths are derived from existing theories and logical analysis rather than from empirical data collected from vocational colleges.

Future research should aim to bridge this gap. Empirical studies could include: 1) Case studies of vocational colleges that are early adopters of AI to investigate the practical challenges and success factors in implementing similar professional development initiatives. 2) Longitudinal studies that track a cohort of teachers through an AI-focused professional development program to measure changes in their TPACK and teaching practices over time. 3) Survey-based research to assess the current state of AI literacy, attitudes toward technology, and perceived barriers to professional development among a wider population of vocational college teachers.

Such empirical work would serve to test, refine, and enrich the conceptual framework proposed here, providing more concrete and context-specific guidance for educational policymakers and practitioners.

5. Conclusion

The AI era presents severe challenges to the professional development of vocational college teachers, yet it also harbors unprecedented opportunities. The interactive relationship among technology, capital, and habitus constitutes the macro and micro environment for teacher professional development. Simply emphasizing technological empowerment while neglecting the rational allocation of capital and the complexity of teachers' habitus will make it difficult to achieve truly effective teacher professional development.

The multidimensional development path proposed in this study—intelligent human-AI collaboration, curriculum system redesign, teacher community building, and the active transcendence of habitus—is an interconnected, dynamically evolving system. Its core is to adhere to a student-centered approach and return to the original mission of education, viewing technology as a means to achieve a higher quality, more equitable, and more humanistic education, rather than as an end in itself. The ultimate direction of a teacher's professional development is to guide students to become complete individuals who are mentally rich, emotionally full, creative, and compassionate. This is the true essence of education that AI can never achieve. Only in this way can vocational college teachers successfully transform from "craftsmen of teaching" to "mentors" amidst the tide of the AI era, cultivating innovative technical and skilled talents who can adapt to and lead the development of future society, thereby providing a solid talent foundation for the transformation and upgrading of the national economy and society.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

Bourdieu, P. (1998). *Practical Reason: On the Theory of Action* (Translated by L. Meng, & L. Kang). Central Compilation & Translation Press.

Chen, X. Y. (2017). *Research on the Development of Ideological and Political Theory Teachers Based on The Field Theory.* Master's Thesis, Huazhong University of Science & Technology.

Fan, G. S. (2020). The Path of Teacher Professionalization in the AI Era. *Education Research Monthly, No. 7,* 77.

Lu, H., & Zhao, Y. Q. (2025), Integrating Teacher Education and Artificial Intelligence: Value, Content, Paths and Prospects. *Continuing Education Research, No. 10,* 44.

Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record, 108,* 1017-1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Tian, H. J. (2021). College and University Teachers Development at the Age of AI: Ideological Breakthrough and Roadmap Unfolding. *Journal of South China Normal University (Social Science Edition), No. 4*, 58.

Xu, M. X., & Li, X. H. (2025). The Reality and Strategies of Cultivating Teachers' Digital Literacy under the TPACK Framework. *Journal of Teaching and Management,* 53.

Yu, J. F., & Zhang, J. X. (2022). Analysis on the Professional Development of Teachers in Open Universities under the Framework of AI-TPACK Theory. *Continuing Education,* 104.

Yu, S. Q., & Wang, Q. (2019). Analysis of Collaborative Path Development of "AI + Teachers". *E-Education Research,* 17.