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The Role Transformation of Higher Vocational College Teachers in the Context of Generative AI: From Knowledge Transmitters to "Intelligent Mentors"

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Abstract: ***Generative Artificial Intelligence (GAI) is profoundly reshaping the logic of knowledge production and the organizational forms of teaching in higher vocational education. Faced with the practical dilemma that higher vocational college teachers generally lack hands-on experience in AI-assisted teaching, the traditional role of the "knowledge transmitter" can no longer adapt to the new normal of human–machine collaborative instruction. Based on an analysis of the current state of GAI teaching in higher vocational colleges, this paper proposes that teachers should transform from "knowledge transmitters" to "intelligent mentors," systematically elaborates the competence structure of the "intelligent mentor," constructs a closed-loop teaching model of "AI-assisted design before class—human–machine collaborative inquiry in class—intelligent assessment feedback after class," and explores a path for enhancing teacher competence through college–enterprise collaboration (GAI certification training and teaching-research communities). The study shows that the role transformation of teachers is a key prerequisite for the practical implementation of generative AI literacy education; through the closed-loop teaching model and systematic competence development, classroom teaching effectiveness can be significantly improved, thereby realizing a paradigm shift from "teaching knowledge" to "cultivating literacy."***

Keywords: Generative Artificial Intelligence, Higher Vocational College Teachers, Role Transformation, Intelligent Mentor, Human–Machine Collaboration**.**

1. Statement of the Problem

The rapid development of generative artificial intelligence is transforming the way knowledge is produced, disseminated, and applied, and is exerting a profound influence on the field of education. General-purpose large models, represented by ChatGPT and DeepSeek, have already approached or even surpassed the foundational abilities of average practitioners in multiple dimensions such as text generation, coding, image creation, and data analysis. This has placed the traditional teaching objective of "imparting knowledge to students" under an unprecedented challenge. For higher vocational education, whose core mission is to cultivate technically skilled talent, this impact is particularly direct: the professional positions that students will face in the future are precisely the fields most significantly affected by GAI-driven automation.

At the same time, the overall digital literacy and GAI application capabilities of higher vocational college faculty have not yet kept pace with the evolution of technology. Relevant surveys show that a considerable proportion of teachers lack systematic practical experience in AI-assisted teaching, and generally exhibit the problem of "not knowing how to use it, not daring to use it, and not using it well" when confronted with GAI tools. On the one hand, teachers are accustomed to a traditional teaching model centered on textbooks and lectures, and lack the awareness and skills to appropriately integrate GAI tools into teaching scenarios. On the other hand, students have already been widely exposed to and spontaneously using various GAI tools outside the classroom, so that the "digital divide" between teachers and students in technology use is being inverted—students are more familiar with new tools than teachers are. This mismatch between supply and demand objectively requires a fundamental transformation of the teacher's role.

From a deeper perspective, the impact of GAI on the teacher's role is not simply "tool substitution," but "functional restructuring." When knowledge acquisition becomes instantaneous and nearly cost-free, the legitimacy of the teacher as the sole source of knowledge is weakened, and the core value of teachers needs to be re-anchored. Teachers are no longer "the sole possessors and transmitters of knowledge," but should become "designers of learning, guides of thinking, and guardians of values." Therefore, exploring the direction and path of the role transformation of higher vocational college teachers in the context of GAI is of significant theoretical and practical importance.

2. Drivers and Theoretical Foundations of Teacher Role Transformation

2.1 GAI Restructures Knowledge Production and Shakes the Foundation of the Traditional Teacher Role

In traditional teaching, teachers hold a dominant position by virtue of their systematic and authoritative mastery of disciplinary knowledge, and the legitimacy of this position stems from the relative scarcity of channels for knowledge acquisition. Generative artificial intelligence has overturned this premise. Students can obtain clearly structured and detailed answers to their questions within seconds through simple natural-language interaction, and the marginal cost of knowledge acquisition approaches zero. This makes "knowledge transmission," the most fundamental function of teachers, no longer their exclusive advantage, thereby shaking the foundation of the teacher's role.

2.2 Human–Machine Collaboration Becomes the New Normal of Teaching and Calls for a New Teacher–Student Relationship

As GAI tools enter the classroom, the participants in teaching activities have evolved from the binary structure of "teacher–student" into the ternary structure of "teacher–student–intelligent agent." The intelligent agent can serve both as a partner in students' autonomous learning and as an assistant for teachers in lesson preparation, question design, and assessment. Under this new normal of human–machine collaboration, the teacher's responsibilities are no longer centered on "explaining knowledge clearly," but shift toward "designing effective learning activities, guiding students to use intelligent tools appropriately, and cultivating students' critical thinking and ethical awareness." The substantial release of classroom time creates possibilities for teachers to move toward higher-level value creation, while also imposing new demands on the positioning of the teacher's role.

2.3 The Theoretical Support of the "Human–Machine Symbiosis" Paradigm

From a theoretical perspective, the transformation of the teacher's role can be situated within the analytical framework of "human–machine symbiosis." Under this paradigm, humans and machines are not in a substitutive but a complementary relationship: machines excel at information retrieval, generation, and repetitive processing, while humans excel at meaning construction, value judgment, and emotional communication. Teachers should proactively position themselves in the links that machines can hardly replace—motivating learning, guiding deep learning, cultivating values, and providing emotional support. This paradigm provides a theoretical basis for the positioning of the "intelligent mentor" role and delineates a clear boundary for the direction of teacher transformation.

3. The Connotation and Competence Structure of the "Intelligent Mentor"

3.1 The Connotation of the "Intelligent Mentor" Role

The so-called "intelligent mentor" does not mean replacing teachers with artificial intelligence; rather, it refers to teachers who are able to skillfully command generative AI tools and fulfill their educational functions in human–machine collaborative contexts. Its core characteristics are threefold: first, "adept use of intelligence," i.e., the ability to convert GAI tools into productive tools for teaching rather than responding passively; second, "steadfast commitment to education," i.e., always holding the direction and values of education in human–machine collaboration and preventing the alienation of technology; and third, "continuous evolution," i.e., possessing the professional development capacity to iterate in step with technology.

3.2 The Competence Structure of the "Intelligent Mentor"

The competence structure of the intelligent mentor can be summarized in four dimensions:

First, technological application competence. Teachers need to master the operation of mainstream GAI tools and prompt engineering skills, and be able to precisely invoke tools as needed to complete tasks such as lesson plan design, courseware generation, exercise construction, and learning analytics. This is the "tool foundation" of the intelligent mentor and the most basic competence dimension.

Second, instructional design competence. Technological competence must serve instructional design. Teachers need the overall design ability to integrate GAI into teaching objectives, content, activities, and assessment, and to design "human–machine collaborative" learning tasks that turn GAI into a scaffold for deep learning rather than a superficial substitute.

Third, collaborative facilitation competence. In a human–machine collaborative classroom, teachers need the ability to guide students in using GAI appropriately, including setting boundaries for use, discerning the reliability of AI output, and organizing critical discussions around AI-generated results. This competence determines whether GAI becomes an "aid to learning" or a "breeding ground for intellectual laziness."

Fourth, ethical governance competence. Teachers should possess the literacy to identify and respond to GAI risks, including academic integrity supervision, deepfake detection, and algorithm bias prevention, and be able to permeate correct technological values into teaching so as to guide students in using AI responsibly.

The four dimensions above support and build upon one another, jointly constituting the complete competence profile of the "intelligent mentor." Technological application competence is the premise, instructional design competence is the core, collaborative facilitation competence is the key, and ethical governance competence is the safeguard.

4. The Construction and Practice of the Closed-Loop Teaching Model

Centered on the role positioning of the "intelligent mentor," this paper proposes a closed-loop teaching model of "AI-assisted design before class—human–machine collaborative inquiry in class—intelligent assessment feedback after class," as the practical vehicle for realizing the role transformation of teachers.

4.1 Before Class: AI-Assisted Design

In the pre-class preparation stage, teachers use GAI tools to complete the preliminary generation and optimization of instructional design. Specifically, this includes using large models to automatically generate instructional design frameworks based on curriculum standards, generating layered and personalized learning tasks through prompt engineering, quickly retrieving and integrating multimodal teaching resources with AI, and using AI for learning-condition prediction and analysis of teaching priorities and difficulties. The teacher's role shifts from "independently writing lesson plans" to "reviewing and optimizing AI-generated plans," redirecting the time saved to in-depth analysis of students' learning conditions and creative design of teaching activities.

4.2 In Class: Human–Machine Collaborative Inquiry

In the classroom teaching stage, teachers organize students to conduct inquiry around authentic problems, with GAI embedded as an inquiry tool and collaborative partner. Students can use GAI for information retrieval, comparison of options, and artifact generation, while teachers focus on the responsibilities of task design, process facilitation, and intellectual guidance. The key role of teachers lies in: designing open-ended tasks that require deep thinking, so as to prevent students from falling into the shallow learning of "AI answering on their behalf"; guiding students to critically examine AI output and cultivating their ability to discern information and think independently; and promoting the collision and integration of viewpoints in group collaboration. At this point, teachers transform from "lecturers on the podium" into "organizers of inquiry activities and thinking coaches."

4.3 After Class: Intelligent Assessment Feedback

In the post-class stage, teachers use GAI tools to enhance the relevance and timeliness of assessment. With the help of AI, homework can be intelligently graded with personalized feedback; through intelligent analysis of learning data, students' weak points and learning styles can be identified; and based on the analysis results, differentiated learning resources and suggestions can be pushed to students. Teachers thus transform from "implementers of uniform assessment" into "data-based personalized learning diagnosticians and tutors," realizing a shift of assessment from "summative" toward "formative and developmental."

The operation of the closed-loop teaching model liberates teachers' energy from a large amount of repetitive and routine work, allowing them to concentrate on high-value links such as instructional design, thinking guidance, and personalized tutoring, thereby completing the role transformation in substance. Practice shows that after adopting this model, the proportion of classroom time devoted to human–machine collaborative inquiry and in-depth discussion can be significantly increased, and teaching effectiveness is markedly improved.

5. The College–Enterprise Collaboration Path for Enhancing Teacher Competence

The role transformation of teachers will not occur naturally; it requires systematic competence development as support. This paper proposes a path for enhancing teacher competence based on college–enterprise collaboration.

5.1 GAI Certification Training: Building a Systematic Competence-Enhancement Mechanism

In view of the uneven AI literacy among teachers, it is advisable to introduce or develop a GAI competence certification system for teachers, forming a closed-loop mechanism of "training — assessment — certification — retraining." The training content should cover the four dimensions of technological application, instructional design, collaborative facilitation, and ethical governance, adopting a combination of "intensive seminars + practical workshops + teaching observation" so as to avoid one-way, lecture-based training. The certification results can be appropriately linked to teacher evaluation and professional title assessment, thereby creating positive incentives.

5.2 College–Enterprise Collaboration: Building a Practice-Oriented Platform for Capability Transformation

The improvement of teachers' GAI application capabilities cannot be separated from tempering in authentic application scenarios. Relying on college–enterprise collaboration platforms, on the one hand, enterprise engineers and technical experts can be introduced to participate in teacher training, helping teachers understand the latest application forms of GAI in industry; on the other hand, teachers can be organized to participate in real enterprise projects or industry–education integration projects, deepening their understanding of GAI applications through "learning by doing." At the same time, teachers should be encouraged to co-build teaching resources and case libraries with AI enterprises, thereby realizing a positive interaction between capability enhancement and teaching reform.

5.3 Teaching-Research Communities: Creating a Continuously Evolving Professional Ecosystem

Role transformation is a continuous process that requires peer support and professional guidance. It is advisable to establish teaching-research communities with internal and external linkages, carrying out collective lesson preparation, heterogeneous lessons on the same topic, case sharing, and teaching reflection around the application of GAI in teaching. Through experience sharing and collaborative problem-solving within the community, the transformation cost for individual teachers can be reduced, the diffusion of excellent experience can be accelerated, and a professional development ecosystem of "spreading from points to areas and improving overall" can be formed.

6. Conclusion

In the context of generative artificial intelligence, the role of higher vocational college teachers is transforming from "knowledge transmitters" to "intelligent mentors." This transformation is both an objective requirement of technological change and an inevitable choice for education to return to its essence of cultivating people. On the basis of analyzing the drivers of this transformation, this paper elaborates the connotation and four-dimensional competence structure of the "intelligent mentor," proposes the closed-loop teaching model of "AI-assisted design before class — human–machine collaborative inquiry in class—intelligent assessment feedback after class," and explores the path for enhancing teacher competence through college–enterprise collaboration.

It should be noted that the role transformation of teachers is a systematic project that requires not only the proactive initiative of individual teachers but also the supporting efforts of institutions in system design, resource investment, and environment building. How to construct a long-term mechanism for teacher competence development and how to

scientifically evaluate the effectiveness of teacher role transformation still await further deepening in subsequent research. Only by successfully realizing the role transformation of teachers can generative AI literacy education truly move from concept to practice, thereby cultivating high-quality technical and skilled talent capable of commanding technology and facing the future.

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