

The Transformation, Challenges and Path Reconstruction of Interaction Between Teachers and Students in Higher Education Institutions in the Era of Intelligent Media

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In the era of intelligent media, the interaction between teachers and students in higher education is undergoing a profound transformation. The model has shifted from one-way transmission to multi-agent, two-way collaboration involving “teacher-student-AI (artificial intelligence)”. Interaction depth moves from surface Q&A to deep thought engagement, supported by instant, precise feedback and a blended virtual-physical space. New forms such as data-driven personalized interaction and immersive collaborative learning have emerged. However, this evolution brings significant challenges: over-reliance on technology may weaken cognitive autonomy; virtual interaction risks emotional detachment and trust erosion; ethical concerns like algorithmic bias and data privacy arise; teachers’ roles become blurred; and evaluation systems lag behind technological advances. Future pathways should position AI as a supportive tool while upholding human centrality. Strengthening emotional connection through online-offline blending, reforming assessment to value process and growth, and empowering teachers as digitally literate “learning guides” and “emotional connectors” are key to building a healthy, sustainable interactive ecosystem.

Keywords: intelligent media era, teacher-student interaction, human-AI collaboration, emotional engagement, educational transformation, digital literacy

A Profound Transformation of Teacher-Student Interaction

Interaction Mode: From “One-Way Transmission” to “Two-Way Synergy”

Traditional Mode: The “lecture-reception” model centered on the teacher, with interaction mostly being simple question-and-answer sessions where the teacher asks and the student responds.

Intelligent Media Era: Both teachers and students become the main subjects of learning. Teachers play more of a guiding and collaborating role, working together with students to solve problems.

Interaction Subjects: From “Binary Relationship” to “Ternary Structure”

Traditional Mode: The interaction subjects are teachers and students, forming a “teacher-student” binary relationship.

Intelligent Media Era: The interaction subjects expand to a “teacher-student-AI (artificial intelligence)” ternary structure, with AI becoming an important intermediary and auxiliary tool. This change requires teachers

not only to interact with students but also to learn to collaborate with AI and design human-machine collaborative teaching activities.

Interaction Depth: From “Surface-Level Questioning” to “Deep-Level Thought Collision”

Traditional Mode: Interaction mostly stays at the level of knowledge memory and understanding, with limited depth.

Intelligent Media Era: AI technology can precisely capture students’ learning states and thought trajectories, driving interaction towards “deep-level thought collision”.

Interactive Feedback: From “Lagging and Vague” to “Instant and Precise”

Traditional Mode: Feedback is mostly provided after class through homework correction or random comments during class, which is often delayed and vague.

Intelligent Media Era: AI has established a full-process, automated feedback system, achieving instant, precise, and personalized feedback.

Interactive Space: From “Physical Classroom” to “Virtual-Physical Integration”

Traditional Mode: Interaction mainly occurs within the fixed time and space of the physical classroom.

Intelligent Media Era: Teaching has broken through the limitations of physical space and integrated virtual space, forming a multi-dimensional interactive field of “teacher-student-AI-environment”. Students can participate in discussions, submit assignments, and receive feedback through mobile terminals at any time and any place, making interaction more flexible and convenient.

New Forms of Diversified Interaction

New Changes in Interactive Forms

Diversification of Interactive Subjects: Expanding from the binary of “teacher-student” to the ternary of “teacher-student-AI”, with AI becoming a collaborative partner.

Integration of Virtual and Physical Interactive Spaces: Breaking through the physical classroom to form a mixed field of “online + offline + virtual”.

Multimodalization of Interactive Content: Combining text, voice, video, 3D models, etc., to present knowledge more vividly.

Intelligentization of Interactive Processes: AI analyzes students’ learning situations in real time, providing personalized feedback and resource recommendations.

Specific New Forms

Real-Time Two-Way Interaction: Achieving “zero-time difference” questions and answers, voting, and quick responses through smart terminals.

Immersive Collaborative Learning: Utilizing VR/AR technology for virtual experiments and scenario simulations, such as VR-reconstructed tea gardens.

Data-Driven Precise Interaction: AI collects interaction data to generate learning profiles, supporting personalized guidance.

Human-Machine Collaborative Creative Output: Teachers design frameworks, and AI assists in generating teaching resources such as videos and courseware.

The Multidimensional Challenges Faced by Interactive Learning

Technological Dependence and Weakening of Cognitive Autonomy

Student Dependency Risk: Excessive use of AI tools may lead to student mental inertia, such as relying on AI to complete homework and search for answers, thereby weakening independent thinking and innovation capabilities.

Teacher Technological Anxiety: Rapidly evolving technology causes teachers to experience anxiety about “not knowing how to use” or “daring not to use” it, fearing being marginalized by technology.

Cognitive Outsourcing: Outsourcing tasks such as information processing and memory to AI may lead to the degradation of thinking abilities among both teachers and students.

Weakening of Emotional Interaction and Relationship Alienation

Weakening of Emotional Connection: Virtual interaction reduces face-to-face communication, weakening emotional resonance and trust building.

Risk of Relationship Commodification: Technological intermediaries may make interactions more utilitarian, transforming the teacher-student relationship from “person to person” to “person to tool”.

Trust Crisis: Technological black boxes (such as opaque algorithms) and AI-assisted homework completion may increase mutual suspicion between teachers and students, damaging the foundation of trust.

Ethical and Fairness Challenges

Data Privacy Leaks: AI systems collect students’ sensitive information. If not managed properly, it can lead to privacy leaks and data abuse.

Algorithmic Bias: Biased training data may result in unfair evaluations, such as discriminatory feedback towards specific groups.

Digital Divide: Uneven resource allocation exacerbates educational inequality. Teachers and students in economically underdeveloped areas may not be able to enjoy the benefits of technology fairly.

Role Ambiguity and Difficulty in Defining Responsibilities

Role Conflict: As teachers shift from “knowledge transmitters” to “learning facilitators”, the blurred role boundaries lead to confusion in their positioning.

Ambiguous Responsibilities: When AI makes errors in assisting with scoring and decision-making, it is difficult to define responsibility, which affects educational accountability.

Squeezed Emotional Labor: AI cannot replace emotional support, and teachers have to invest more emotional labor to make up for the technological deficiency, which can easily lead to job burnout.

Lagging Evaluation System and Excessive Technological Rationality

Evaluation Imbalance: Over-reliance on intelligent feedback (such as data and charts) may neglect students’ emotions, values, and other dimensions, leading to one-sided evaluations.

Excessive Technological Rationality: Dominance of instrumental rationality may cause the educational process to neglect humanistic care, reducing teacher-student interaction to technical operations.

Reconstructing Future-Oriented Response Paths

Clarifying the Technological Boundary

Educators should position AI as an “auxiliary tool” rather than a “replacer”, and adhere to “human-machine integration” in areas requiring emotional care and value guidance.

Strengthening Emotional Interaction

Educators can utilize technologies such as online discussions and video conferences to enhance emotional communication, and at the same time, focus on students' growth needs through educational dialogues.

Reconstructing the Evaluation System

Educators can establish an evaluation system that emphasizes the process and development, paying attention to students' thinking changes and emotional experiences, rather than merely their knowledge acquisition.

Empowering Teachers' Digital Literacy

Teachers need to transform from "Knowledge Authorities" to "Learning Guides" and "Emotional Connectors" to truly achieve educational goals in the era of technological empowerment.

Conclusion

The wave of the intelligent media era has profoundly reshaped the ecosystem of interaction between teachers and students in higher education institutions. Interaction is undergoing a fundamental shift from "one-way transmission" to "two-way collaboration" and "deep co-learning", demonstrating new characteristics such as bidirectional interaction models, trilateral interaction subjects (teacher-student-AI), intelligent interaction processes, the integration of virtual and real interaction spaces, and immediate and precise interaction feedback. Diverse new forms, such as data-driven precise interaction and immersive collaborative learning, have expanded the breadth and depth of teaching.

However, this transformation is also accompanied by severe challenges: Technological reliance may weaken cognitive autonomy, virtual spaces can lead to emotional detachment and trust crises, algorithmic bias and data privacy raise ethical risks, and the role boundaries of teachers and the lagging evaluation system also urgently need to be restructured.

Facing challenges, it is an urgent task to build a new, healthy, and sustainable interactive ecosystem. The core approach lies in clearly defining the auxiliary boundaries of technology, adhering to the humanistic core of education, strengthening emotional connections through an integrated online and offline strategy, and establishing a composite evaluation system that combines technological rationality and humanistic values. Ultimately, teachers should actively embrace changes, complete their digital transformation from "knowledge authorities" to "learning guides" and "emotional connectors", and achieve higher-level educational goals with the empowerment of technology.

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