

The Change and Challenge of Teacher-Student Relationship in the Era of Artificial Intelligence: Teaching Interaction and Emotional Connection

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Abstract: With the rapid development of artificial intelligence (AI) technology, its application in higher education has gradually shifted from traditional teaching aids to deeper levels of interactive learning and emotional connection support. AI can enhance teaching efficiency, personalized learning, and real-time feedback; however, in areas such as emotional communication and teacher-student interaction, AI still cannot fully replace the role of teachers. This study aims to explore the transformation of teacher-student relationships in the era of AI, analyze the impact of AI technology on teaching interaction, emotional support, and teacher-student trust, and propose strategies to address these challenges. The research findings indicate that while AI has significant advantages in improving educational efficiency, it has limitations in interpersonal emotional support and the transformation of the teacher's role. To ensure the comprehensiveness and humanization of education, educators should strengthen emotional care and improve students' emotional literacy in the use of AI, and implement transparent data management and privacy protection measures to enhance teacher-student trust. The study also suggests that by enhancing teacher-student trust, strengthening emotional support, and increasing transparency, educators can effectively address the challenges of teacher-student relationships in the AI era. This research provides theoretical support and practical guidance for the integration of AI technology with educational humanistic care, promoting more comprehensive, personalized, and humane educational development.

Keywords: Artificial intelligence; Teacher-student relationship; Emotional support; Teaching interaction

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1. Introduction

With the rapid development of artificial intelligence (AI) technology, its application in higher education has expanded from traditional data processing and management to multiple aspects such as teaching interaction, assessment, and emotional support ^[1]. This transformation not only changes the way teaching content is delivered but also reshapes the forms of teacher-student interaction, emotional communication, and the positioning of teachers' roles. The traditional teacher-student relationship is based on face-to-face teaching

interactions, where teachers are not only transmitters of knowledge but also important sources of emotional support for students. By observing students' emotional fluctuations, behavioral responses, and learning difficulties, teachers can promptly provide psychological guidance and emotional care, establishing deep emotional bonds, which are an indispensable part of the educational process ^[2].

However, with the introduction of intelligent teaching tools and the popularization of smart teaching platforms and AI assistants, traditional teacher-student interaction methods are gradually changing. AI provides personalized learning experiences and efficient feedback to students, significantly enhancing learning efficiency and effectiveness ^[3]. However, while AI can optimize the teaching process and enhance interactive intelligence, whether it can fully replace human teachers in terms of emotional connection and support remains an important question that needs further discussion.

2. The transformation of the relationship between teachers and students in colleges and universities in the era of artificial intelligence

As AI technology becomes more widespread and applied, traditional higher education models are undergoing profound changes, particularly in the construction and interaction of teacher-student relationships. In traditional education, teacher-student relationships primarily rely on face-to-face communication and interaction; teachers are not only transmitters of knowledge but also key figures in providing emotional support and psychological guidance to students ^[4]. However, the introduction of AI has led to the gradual digitalization and intelligence of teaching interactions, learning assessments, and emotional support in the educational process. This transformation has not only brought about innovations in educational models but also sparked extensive discussions about new forms of teacher-student relationships.

2.1. The transformation of teachers' role: From knowledge transmitter to learning guide

In the AI era, the role of teachers is shifting from traditional "knowledge transmitters" to "learning guides" and "emotional supporters" ^[5]. The introduction of AI technology has automated and intelligentized many traditional teaching tasks (such as knowledge transmission, grading, and homework correction), reducing the workload for teachers in these areas and allowing them more time to focus on students' individual needs, emotional support, and psychological counseling. For example, IBM Watson can analyze students' learning data, helping teachers understand each student's progress and issues in real-time. Through the platform, teachers can customize learning plans for each student, address their learning difficulties, and provide targeted guidance and support. This transformation means that teachers are no longer just information conveyors but are increasingly taking on the role of learning guides, responsible for helping students understand and apply knowledge, ensuring they overcome obstacles in their individual learning processes.

2.2. The interaction between students and teachers: From face to online and data-driven

The introduction of AI has transformed the way teachers and students interact, shifting from face-to-face interactions in classrooms to engaging with teachers through various online platforms. This interaction is not confined to the classroom; students can communicate with teachers and AI anytime and anywhere via the internet. This makes interactions between students and teachers more flexible and convenient, but it also leads to a distancing of emotional connections ^[6]. Many universities have introduced online tutoring platforms such as Chaoxing and Rain Classroom, allowing students to communicate with teachers in real-time through these platforms. Meanwhile, the application of AI teaching assistants enables students to interact with educational

systems using AI technology, such as answering questions, receiving learning feedback, and providing resource recommendations. This mode of interaction significantly expands the spatiotemporal scope of teacher-student interactions, yet its online nature makes emotional exchanges more one-sided and colder. Although AI teaching assistants can quickly respond to students' academic needs, they cannot perceive students' emotional states through non-verbal signals (such as eye contact and body language) like teachers can, thus failing to provide emotional support. This online and data-driven interaction makes the relationship between students and teachers more instrumental, which, while improving efficiency, may also lead to reduced dependence on teachers and even emotional detachment in some cases.

2.3. The distance between teachers and students and virtualization

As AI and virtual teaching tools become more prevalent, the sense of distance between teachers and students is gradually increasing. In traditional classrooms, face-to-face interactions between teachers and students help build strong emotional bonds, whereas in virtual classrooms and online interactions, these bonds become more virtual and weaker ^[7]. For example, in Massive Open Online Courses (MOOCs), students often interact with teachers without actual face-to-face contact. Although AI systems can provide personalized learning suggestions and tutoring, students still lack opportunities for deep emotional exchanges with their teachers. Students may interact more with AI teaching assistants or automated systems rather than forming genuine emotional connections with their teachers. While AI can answer questions and offer assistance to some extent, this interaction is more functional than emotionally supportive. This virtualized teacher-student relationship tends to make the learning experience tool-oriented, especially in terms of emotional care and psychological support. Students may feel isolated and unsupported, particularly when facing academic difficulties or emotional distress, as they cannot receive immediate emotional support from their teachers.

3. Challenges of teacher-student interaction in the era of AI

In the era of AI, while AI technology has brought great convenience to education, especially in personalized learning and real-time feedback, it has also gradually exposed its shortcomings in emotional communication, particularly in the emotional interactions between students and teachers. As students increasingly rely on AI technology to complete assignments, receive feedback, and solve learning problems, this dependence not only reduces direct interaction between students and teachers but also leads to a lack of emotional connection. When students encounter learning difficulties or psychological distress, they often can only seek help through mechanical conversations with AI, rather than receiving the necessary emotional support and care from their teachers.

3.1. Students' reliance on AI reduces the opportunity for emotional communication with teachers

As AI technology gradually permeates every aspect of the teaching process, students are increasingly relying on intelligent platforms and AI systems to complete their learning tasks. AI can significantly enhance student efficiency through automated grading, immediate feedback, and personalized learning recommendations. However, this also reduces interaction between students and teachers, especially when facing academic challenges and emotional distress. Students tend to rely more on answers provided by AI rather than face-to-face communication with teachers. The seamless interaction provided by AI technology often deprives students of opportunities for deep emotional engagement with their teachers. For example, when students encounter

difficulties in their studies, they may seek solutions through online platforms' smart tutoring systems or AI-assisted teaching. These systems typically provide step-by-step solutions and answers using algorithms, but they cannot understand the emotional changes students experience during the learning process. When a student is confused about a particular concept, AI only offers standardized answers, lacking emotional support and care. In contrast, teachers can gauge the level of confusion based on the student's tone, expressions, and emotional fluctuations, and provide targeted assistance and encouragement.

3.2. Learning confusion and psychological changes are ignored

In the environment of AI-assisted education, students' psychological changes and emotional needs are often overlooked. When students encounter academic difficulties or psychological distress, they tend to seek solutions through virtual platforms or AI systems. While this approach can address some academic issues, it often fails to provide timely attention and guidance for students' psychological changes, anxiety, and stress. AI systems can recognize students' learning progress but struggle to effectively respond to their emotional states. For example, a student may feel anxious due to prolonged inability to grasp a concept, even leading to self-doubt. In traditional classrooms, teachers can promptly detect students' emotional fluctuations through detailed observations and interactions with them, offering comfort and encouragement. However, in AI-dominated online learning environments, emotional interactions between students and teachers become scarce. Although AI systems can provide personalized learning suggestions based on data, they cannot touch upon students' emotional needs. Students' psychological distress is often ignored, while AI feedback remains cold and fails to offer the emotional support needed by students.

3.3. The insufficiency of cultural care leads to the weakening of the teacher-student relationship

The application of AI technology, especially its widespread use in education, has made the learning process more efficient and personalized. However, this can also lead to a lack of humanistic care. Teachers are not only transmitters of knowledge but also supporters of emotions, counselors for psychological well-being, and guides for students' socialization. AI cannot establish trust and emotional connections with students through language, body language, and emotional resonance like teachers do. Although AI technology can provide immediate academic feedback and guidance, it cannot replace the humanistic care that teachers offer in education, particularly in terms of students' emotional growth and mental health. For example, when students face academic pressure, loneliness, or anxiety, AI teaching assistants may provide standard advice or recommendations for learning resources, but these responses lack the warmth of emotion and fail to offer genuine psychological support through caring tones, encouraging words, and empathetic interactions. This absence of humanistic care results in a lack of emotional support and understanding during the learning process, thereby affecting the depth of teacher-student relationships. The interaction between students and teachers gradually becomes a mere transmission of knowledge and task completion, lacking the deep emotional bond found in traditional teacher-student relationships.

4. Strategies to cope with the challenges of teacher-student relationship in the AI era

4.1. Strengthening the combination of humanistic care and technology

In the AI era, the widespread application of artificial intelligence technology has significantly improved

the efficiency and personalization of education. However, it also brings about some issues that cannot be overlooked, especially in emotional communication and humanistic care. While AI can provide students with precise learning feedback and academic support, it cannot fully replace the emotional support and care that teachers offer in interpersonal interactions. Therefore, while promoting the application of technology, it is essential to strengthen humanistic care and integrate it with AI technology, ensuring that students receive not only academic support but also attention to their emotions and psychology. Teachers should use AI technology to enhance students' learning experiences rather than letting technology completely replace interaction between teachers and students. For example, AI can help teachers analyze students' learning behaviors, identify potential academic difficulties or emotional fluctuations, and based on this data, teachers can provide more humane support. Through the learning data provided by AI, teachers can better understand students' individual needs, adjust teaching strategies in a timely manner, and offer appropriate psychological guidance according to students' emotional changes.

4.2. Improving students' emotional literacy

In the AI era, students' emotional literacy also needs to keep up with the times. The education system should strengthen students' emotional education, helping them learn to recognize, express, and manage their emotions. Through emotional education, students can not only better handle challenges in learning but also maintain good emotional health in an AI-dominated educational environment. Schools and educational institutions can offer courses on emotional education to help students understand and manage their emotions. Such courses can teach students how to identify their own feelings, how to deal with stress, anxiety, and other emotional issues, as well as how to improve learning outcomes through positive emotional management methods. For example, AI can analyze students' learning behaviors, identify potential emotional distress they may encounter, and provide personalized emotional support. Educational institutions can use AI systems to monitor students' emotional states, providing data support for teachers to help them intervene and offer emotional guidance in a timely manner.

4.3. Strengthening transparency and data privacy protection to increase the trust of teachers and students

As AI technology is increasingly integrated into education, students' personal information and learning data are being widely collected and used. While AI systems can provide personalized learning paths and immediate feedback to students, these technological advancements also come with concerns about data security and privacy protection. If educational institutions and teachers fail to address these issues properly, students may develop distrust towards AI systems and their applications, which could undermine the trust between teachers and students. For example, students might worry that their personal information (such as academic progress, test scores, emotional states, etc.) will be accessed by unauthorized individuals or used for improper purposes. Educational institutions and teachers need to ensure that students understand how their data is used and provide adequate privacy protection measures to safeguard their personal information from misuse. By implementing transparent data management, enhancing data security, and actively communicating with students, teachers and educational institutions can not only earn the trust of students but also lay the foundation for the effective application of AI technology. Through these strategies, the use of AI in education can better serve students, improve learning outcomes, and enhance teacher-student relationships.

5. Conclusion

The application of AI technology in teaching interaction and emotional connection brings unprecedented opportunities and challenges to education. The transformation of teacher-student relationships in universities during the era of artificial intelligence is inevitable. Although AI can enhance teaching efficiency and personalization, it still cannot fully replace human teachers in terms of emotional communication and teacher-student interaction. This study delves into the impact of AI technology on teacher-student relationships, exploring key issues such as emotional communication, the transformation of the teacher's role, and trust between teachers and students, and proposes corresponding strategies.

This study reveals the transformation in teacher-student relationships in universities during the AI era, particularly the challenges in teaching interaction, emotional support, and trust building. By examining how AI plays a role in personalized learning, real-time feedback, and teaching interaction, we can better understand its impact on traditional teacher-student relationships and how to maintain and strengthen emotional connections and trust between teachers and students in an intelligent teaching environment. Through this research, educators and policymakers can recognize the balance between technology and humanistic care, understanding that the application of AI in education is not only a technological innovation but also a reevaluation of teacher-student relationships and educational ethics. This study not only provides strong theoretical support for educational practices in the AI era but also offers practical suggestions for integrating technology and humanism in future education, contributing to more comprehensive and humane education.

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