


Chapter 7

Human–AI Co– Agency in Peer–Based Collaborative Pedagogies for Education 5.0

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ABSTRACT

This chapter examines how generative artificial intelligence (GAI) transforms collaborative and peer learning. Building on Vygotskian social constructivism and technology integration frameworks, Teacher-AI Collaboration (TAC), we analyze how AI-mediated interactions shape participation and knowledge co-construction in group learning. Our research reveals that strategic GAI integration enhances peer feedback, facilitates dynamic group formation, and promotes equitable participation in collaborative environments. GAI enhances student-AI-peer interactions across LMS platforms with improved AI literacy and Prompt Engineering. Based on current learning theories, this research shows the potential of GAI integration to democratize participation, reduce cognitive load, and foster sophisticated peer dialogue. We advance theoretical understanding by synthesizing peer learning principles with AI affordances in integrated GAI-LMS systems, providing empirically grounded recommendations for transforming collaborative learning with ethically-centered, human-grounded AI integrations

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INTRODUCTION

Integrating Artificial Intelligence (AI) in education has revolutionized traditional teaching methodologies, fostering a new era of personalized and collaborative learning. This paper explores the intersection of AI literacy, the knowledge, skills, and understanding to interact with AI, and collaborative learning, an educational pedagogical approach based on socio-cultural learning theory, emphasizing the role of prompts in enhancing educational outcomes in holistic learning environments. By examining AI-driven prompts and collaborative learning strategies, we aim to provide educators with practical insights and guidance for fostering AI literacy among students. This paper will discuss collaborative learning, Artificial Intelligence in Education (AIED), AI literacy, prompt engineering for collaboration, benefits, concerns, future directions, and a conclusion. This paper argues that AI integration in a collaborative learning context in higher education can be achieved through improved AI literacy, effectively prompting proper AI tool alignment.

Reframing Pedagogy in the Age of Education 5.0

Socialization and individualization are measurements of success, which are important but difficult to measure aspects of holistic education. A shift from Education 1.0 to the goals of Education 5.0; Education 1.0 marks the last decades of educational pedagogy. Education 1.0, characterized by a rigid, teacher-centered approach emphasizing rote memorization and standardized testing that served the industrial job market, reflects a behaviorist approach. For decades, education reformists have argued that this traditional approach no longer meets the needs of society. They advocate building upon previous iterations of education (1.0 to 4.0) by integrating advanced technologies and innovative pedagogical methods to create personalized, immersive, and collaborative learning experiences—an approach known as Education 5.0 (Ahmad et al., 2023).

Education 5.0 emphasizes the importance of adapting to the rapid changes in society and technology, focusing on developing critical thinking, creativity, and competencies necessary for success in the 21st century (Ahmad et al., 2023). Key aspects of Education 5.0 include using digital learning environments, competency-based education, and incorporating emerging technologies such as artificial intelligence and augmented reality to enhance learning (Ahmad et al., 2023). AI Integration requires considering how these systems can cultivate learning environments aligned with Education 5.0 and prepare students for volatility, uncertainty, complexity, and ambiguity (VUCA) environments. There is a gap in the critical role of collaborative learning and the necessity of hybrid strategies that merge AI efficiency with human facilitation in an ethical manner that promotes well-being. For example, AI-supported

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