The Research

Vygotsky (1978) Collaborative Learning

**The Zone of Proximal Development
learning from MKOs, More Knowledgeable Others**

Ferdosipour, A. (2024, September 24). LLMs as a modern partner in Vygotsky's zone of proximal development. Medika Life. [Medika Life](#)

> This article explores the integration of Large Language Models (LLMs) within Vygotsky's educational theory, particularly focusing on the Zone of Proximal Development (ZPD). It discusses how LLMs can serve as scaffolding tools, enhancing learners' cognitive development by providing personalized support and feedback. The author also addresses potential challenges, such as the need for emotional intelligence in AI systems, to fully realize their role in educational settings.

Pappas, C. (2025, May 9). eLearning by connecting: Connectivism pedagogy. LinkedIn. https://www.linkedin.com/pulse/elearning-connecting-connectivism-pedagogy-christopher-pappas--rknwfeLearning Industry+4LinkedIn+4LinkedIn+4

> This article explores how connectivism, a learning theory introduced by George Siemens and Stephen Downes, applies to modern eLearning environments. It emphasizes the importance of personal learning networks, content curation, and collaborative tools in fostering a connected learning experience. The author discusses practical strategies for implementing connectivist principles, such as offering learners choices in their learning paths and encouraging the use of diverse resources and technologies.

Rigopouli, K., Kotsifakos, D., & Psaromiligkos, Y. (2025). Vygotsky's creativity options and ideas in 21st-century technology-enhanced learning design. Education Sciences, 15(2), 257. https://www.mdpi.com/2227-7102/15/2/257MDPI+1MDPI+1

> This article explores the integration of Vygotsky's theories, particularly the Zone of Proximal Development, with contemporary technology-enhanced learning designs. It emphasizes the evolving role of teachers as designers of effective learning scenarios, highlighting the importance of creativity in connecting pedagogy, content, and technology. The authors discuss how Vygotsky's emphasis on the teacher's role in assessing learners' developmental levels can inform the creation of innovative, technology-supported educational experiences.

Urlaub, P. (2024, February 5). Vygotsky meets ChatGPT: Designing transformational education by applying learning theories to innovative technologies. MIT Open Learning. https://medium.com/open-learning/vygotsky-meets-chatgpt-f4a6a0460913Medium+2Medium+2Medium+2

> This article explores the integration of generative AI tools, like ChatGPT, within educational frameworks, emphasizing the importance of grounding such innovations in established

learning theories, particularly Vygotsky's concepts of the Zone of Proximal Development and scaffolding. The author argues that without a theoretical foundation, the use of AI in education may lead to superficial learning experiences. By aligning AI applications with pedagogical principles, educators can create more meaningful and effective learning environments.

Previous research: Vygotsky & contemporary digital hives

drbex.net/portfolio-2025

Ed.D. EdTech dissertation
Dissertation: *Examining the Experiences of Online Professional Development: A Teacher Education Twitter-Based Professional Learning Network* (2020).

Themes of collaborative learning, Communities of Practice, microlearning, mentorship and coaching, Professional Development and Leadership Development, mLearning, eLearning, social constructionism, constructivism.'

The PACE model: Application

Generative AI (GenAI) is revolutionizing adult learning across various sectors by enhancing personalization, adaptability, and collaboration. These advancements align seamlessly with your PACE model—Personalized, Adaptive, Collaborative, and Ecosystem-driven learning. Below is an in-depth exploration of how GenAI is being utilized in adult education, supported by case studies and recent developments.
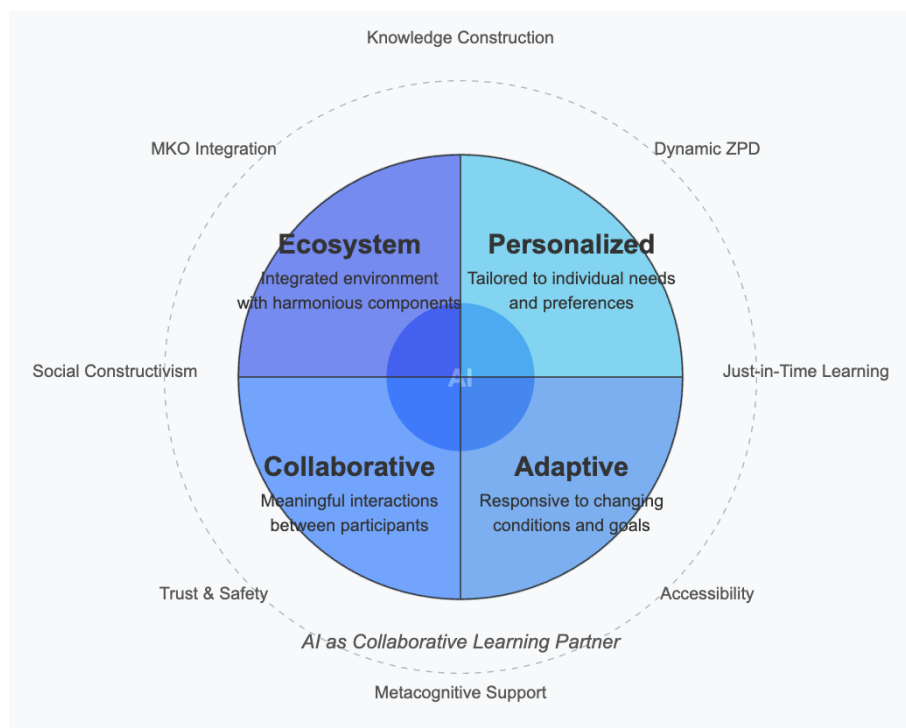
P   Personalized Learning with GenAI

How It Works

GenAI personalizes learning by analyzing individual learner data—such as preferences, performance, and goals—to generate tailored content. This includes customized lesson plans, quizzes, and study materials that cater to each learner's unique needs.[x]cube LABS+1Axios+1

Case Studies & Applications

- **AI-Generated Educational Podcasts**: A study introduced PAIGE, a system that converts textbook chapters into personalized podcasts based on learners' majors and interests. The personalized podcasts led to improved learning outcomes compared to traditional reading materials. arXiv

- **Intelligent Tutoring Systems**: Platforms like SmartTutor at the University of Hong Kong provide personalized support by combining internet technology, educational research, and AI to adapt to adult learners' needs. Wikipedia

- **AI Tutors in Higher Education**: Arizona State University partnered with OpenAI to provide students with personalized AI tutors using ChatGPT Enterprise, enhancing learning and creativity in higher education. Business Insider

A   Adaptive Learning with GenAI

How It Works

GenAI enables adaptive learning by continuously assessing learner performance and adjusting content difficulty and pace accordingly. This dynamic approach ensures that learners are neither bored nor overwhelmed, optimizing the learning experience.

Case Studies & Applications

- **AI-Augmented Learning Architecture**: The A4L framework developed by the National AI Institute for Adult Learning supports personalized and scalable learning by collecting and analyzing data to inform both learners and educators. arXiv

- **Adaptive Tutoring Systems**: Researchers are leveraging AI to build adaptive tutoring systems that help teachers differentiate instruction and assist students in subjects like math, providing personalized support based on individual learning needs. Berkeley School of Education

- **Personal AI Tutors**: A case study at UniDistance Suisse implemented an AI tutor that generated microlearning questions and modeled each student's understanding, leading to significant improvements in academic performance. arXiv+1theaustralian.com.au+1

C   Collaborative Learning with GenAI

How It Works

GenAI fosters collaborative learning by facilitating group interactions, discussions, and problem-solving activities. AI tools can mediate conversations, provide real-time feedback, and help coordinate group tasks, enhancing the collaborative learning experience.Institute for Adult Learning

Case Studies & Applications

- **Collaborative Problem-Solving in Entrepreneurship Education**: A study demonstrated that integrating GenAI tools into collaborative problem-solving scenarios in entrepreneurship education enhanced learning outcomes while keeping human agency central. The IAFOR Research Archive -

- **English as a Foreign Language (EFL) Instruction**: In a Business English course, GenAI was used to facilitate collaborative learning tasks such as vocabulary acquisition and speaking activities, leading to increased engagement among adult learners. NTU Language Center

- **AI in Collaborative Learning Events**: Research highlighted the role of GenAI in collaborative learning and collective sensemaking during adult learning events, emphasizing the importance of human-AI collaboration. ResearchGate

E   Ecosystem the overarching framework – "all of it"

Animation