Integrating Artificial Intelligence in Language Education to Develop Communication and Creativity Competencies for Industry 4.0

Manik More[1], Maina Awatade[2], Satyashil Kolekar[3]

Fabtech Technical Campus, College of Engineering and Research, Sangola, Maharashtra, India[1,3]

SKN Sinhgad College of Engineering, Korti, Pandharpur, Maharashtra, India[2]

Abstract: *The rapid transformation of workplaces under Industry 4.0 has intensified the demand for professionals who demonstrate not only technical expertise but also advanced communication and creativity competencies. While Artificial Intelligence (AI) has significantly influenced technical training, its systematic integration into language education for fostering higher-order communicative and creative skills remains underexplored. This paper proposes a conceptual framework that integrates adaptive AI tutoring systems, generative models, multimodal interaction technologies, and project-based authentic assessment to enhance language-mediated communication and creative problem-solving capabilities. The framework emphasizes personalized learning trajectories, pragmatic competence, interdisciplinary literacy, and industry-aligned collaborative tasks. Additionally, the study outlines pedagogical design principles, implementation pathways, assessment strategies, and validation mechanisms to ensure ethical and effective AI deployment in educational settings. By bridging classroom instruction with industry communication demands, the proposed model contributes to the development of future-ready graduates capable of functioning effectively in dynamic, technology-driven environments.*

Keywords: Artificial Intelligence, Industry 4.0, Language Education, Communication Competence, Creativity, Adaptive Learning, Generative AI, Project-Based Learning

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