Developing and Validating the EME–L Model: An Integrated Framework for AI-Enhanced Multimedia Exhibition Learning in Higher Education

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ABSTRACT

This study developed and validated the Experience–Media–Evaluation–Learning (EME–L) model, an integrated framework that unifies artificial intelligence, multimedia learning, and learning analytics within a coherent system for designing AI–enhanced multimedia exhibition learning environments in higher education. The rapid growth of immersive technologies, artificial intelligence, and learning analytics has created a need for system-oriented learning design frameworks that align pedagogical goals, learner experience, technological infrastructure, and evidence-based evaluation. In this study, the term AI-enhanced refers to the integration of artificial intelligence and learning analytics to support learning environment evaluation, engagement analysis, and data-informed decision making rather than automated instructional delivery. By synthesizing these three domains into a unified framework, the EME–L model contributes to current academic discussions on AI-enhanced learning environments in higher education. This study contributes to the field of educational technology by proposing the Experience–Media–Evaluation–Learning (EME–L) model as an integrated system framework for designing AI-enhanced multimedia exhibition learning environments in higher education. Unlike conventional instructional design models that primarily focus on pedagogical sequencing, the EME–L framework integrates three interrelated domains–artificial intelligence and learning analytics, multimedia learning technologies, and experiential learning design-within a continuous system lifecycle. Specifically, the framework positions AI and learning analytics as mechanisms for evidence-based evaluation, multimedia technologies as enablers of immersive experience delivery, and experiential learning design as the pedagogical foundation for learner engagement. This integrated perspective provides a conceptual bridge between learning experience design, technological systems, and evidence-based improvement, offering a scalable framework for institutions seeking to develop immersive and data-informed learning environments that respond to current academic and practical demands.

Keywords: EME–L model, experiential learning, learning analytics, artificial intelligence, higher education