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Seven Lessons from Artificial Minds: A Practitioner's Guide to Transformer-Inspired Learning Strategies

Dr. Vladimir Shapiro

Northeastern University, the United States

Abstract

Many evidence-based learning strategies are studied and adopted in isolation, even though they plausibly interact. This paper proposes that the transformer model — the architecture underlying most major AI systems today — offers a unifying framework for integrating them. Seven design principles in the transformer correspond, one-to-one, to seven well-validated findings in human learning research, identified independently by educational researchers. The paper translates each correspondence into a classroom strategy. The seven strategies are: relevance prediction (training selective attention), multi-lens analysis (multiple disciplinary frames), concept migration (varied-context practice), living knowledge maps, structured retrieval practice, foundational return rituals, and full-landscape exposure (whole-domain orientation before sequential detail). Each strategy is documented with its prior research base, estimated time cost, expected student resistance, grading burden, and a measurement instrument. The seven strategies are ranked from easiest to adopt to most demanding, supporting incremental adoption that begins with low-cost additions. A worked example demonstrates the framework's application to an undergraduate course. A validation protocol is proposed that would compare the integrated framework against conventional instruction across seven independent measures of retention (expected within 4–6 weeks), transfer to novel contexts, structural understanding, and metacognitive calibration, and would test whether the strategies have a greater effect in combination than individually. The paper does not claim that students should be trained like AI; it shows how the convergence of two independent research traditions — machine learning architecture and the cognitive science of learning, usually studied separately — yields a framework producing measurable benefits in retention, transfer, structural understanding, and metacognitive calibration.

Keywords: Cognitive Science of Learning; Course Design; Evidence-Based Teaching; Retrieval Practice; Transformer Model