SYNAPSE Model: An Innovative Approach to Integrating Human Learning and Artificial Intelligence

[1]Dr.Sarah Chardonnens

The Université Fribourg, Switzerland

Abstract

This article introduces the SYNAPSE (Sensory Input, Network Adaptation, Participation, Stockage and Embodiment) learning model, an innovative approach that links the cognitive processes of human learning to the complex influences of artificial intelligence (AI). This model proposes a conceptualization in four strata: 1) Reception and activation, where stimuli are captured and initiate cognitive processes; 2) Adaptation and adjustment, illustrating how individuals modify their mental patterns in response to new information; 3) Observation and self-regulation, emphasizing the importance of personal evaluation and metacognition; and 4) Consolidation and storage, detailing the mechanisms of memorization and knowledge retrieval. SYNAPSE stands out for its explicit integration of the benefits and risks of AI at each stage of learning. AI, by facilitating personalized access to educational resources, automating feedback or increasing memorization capacities, can reinforce the engagement and performance of learners. However, risks such as cognitive passivity, loss of critical thinking or dependence on digital tools threaten the construction of lasting intellectual autonomy. Based on an interdisciplinary analysis combining cognitive sciences, educational sciences and artificial intelligence studies, this model proposes not only a solid theoretical framework but also concrete avenues for educators, AI developers and learners. This new approach offers a fresh perspective on how to maximize the benefits of AI while preserving the richness of human learning, thus paving the way for a harmonious co-evolution of technology and pedagogy.

Keywords: Human learning, Artificial intelligence, SYNAPSE model, Cognition and metacognition, Benefits and risks of AI