Keynote : Emmanuel Sander

Analogy at the Heart of Learning - Insights from Mathematical Thinking

Analogy is a central mechanism of human cognition, shaping how knowledge is constructed and learned. It highlights how students' initial, often informal analogies provide essential entry points into formal knowledge, while also setting constraints that must be addressed through instruction. Learning is framed as a process in which teaching deliberately builds on these early analogical structures to foster more aligned and productive ones. Using mathematical thinking as a privileged—though not exclusive—classroom case, this keynote examines how analogy operates in educational settings. By treating mathematics classrooms as a cognitive laboratory, the talk offers practical and theoretical insights into designing learning progressions and supporting conceptual understanding across educational contexts.

About Emmanuel Sander

Emmanuel Sander is Full Professor at the Faculty of Psychology and Educational Sciences at the University of Geneva, where he heads the IDEA Laboratory (Instruction, Development, Education, Acquisition of Knowledge). His work focuses on the mechanisms through which concepts are constructed and transformed in learning, with a particular emphasis on analogy as a core cognitive process. His theory of analogical knowledge construction led him to co-author, with Douglas Hofstadter, Surfaces and Essences: Analogy as the Fuel and Fire of Thinking (Basic Books, 2013), a book nominated for the PEN/E. O. Wilson Literary Science Writing Award and translated into five languages. He is also a member of the French Scientific Council for National Education.