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AI in Chemistry Teaching: Competencies, Knowledge, and Teacher Concerns

Ron Blonder, Weizmann Institute of Science, Israel

The integration of Artificial Intelligence (AI) into education is transforming teaching and learning in both schools and higher education. AI technologies, such as intelligent tutoring systems, automated assessments, and adaptive learning platforms, enhance learning experiences and personalize education, leading to improved student outcomes. However, AI also presents challenges, including data privacy concerns and the digital divide, which educators and policymakers must address. The integration of AI in teaching has raised concerns among teachers. We have identified distinct concern profiles that differentiate AI adaptation by chemistry teachers from the adaptation of general technology. In my talk, I will explore the competencies required for integrating AI into chemistry teaching, drawing on the UNESCO AI competency framework for teachers. I will present chemistry teachers' concerns and critically analyze the TPACK framework of teacher knowledge to develop a theoretical understanding and examine its practical implications for teacher preparation and professional development programs.