From Assessing Science Literacy to Assessing STEM Literacy: Challenges and Promises

Date: 20 November 2024 (Wed)

Time: 14:00-15:30

Venue: Tin Ka Ping Lecture Hall, Faculty of Education (E33-G021)

Language: English

Registration: Online Registration (https://go.um.edu.mo/bvj2tqxi or)

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Speaker:

Prof. Xiufeng LIU is a Chair Professor of STEM Education in the Faculty of Education, University of Macau. Prior to joining the University of Macau, Prof. Liu was a tenured faculty member at St. Francis Xavier University and University of Prince Edward Island, both in Canada, and most recently a SUNY Distinguished Professor of Science Education in the Graduate School of Education, University at Buffalo, State University of New York. Prof. Liu's research interests include measurement and evaluation in STEM education, student conceptual progression of cross-cutting concepts (i.e., matter and energy), and student and teacher STEM identity measurement and development. His research approach is quantitative and statistical, guided by cognitive and social-cultural learning and development theories. He has more than 130 refereed publications including 14 books. Prof. Liu's is a Fellow of the American Association for the Advancement of Science (AAAS, 2020), a recipient of the Exceptional Scholars Sustained Achievement Award, University at Buffalo (2018), the Distinguished Achievement Award for Excellence in Publishing, National Science Teaching Association (NSTA, 2010), and a guest/honorary professor at a few universities in China (e.g., Beijing Normal University, Northeast Normal University, Shandong Normal University).

Abstract:

Promoting science literacy is an ultimate goal of K-12 science education. Prof. Liu's research involved assessing student conceptual development of big ideas of science -- matter and energy; Prof. Liu also researched on assessing teacher learning in interdisciplinary science inquiry. Since early 2020's, his research has been focusing on assessing STEM teaching and learning. This ongoing research has two strands: Defining and measuring STEM literacy, and defining and measuring science teacher identity. Prof. Liu is pioneering a new methodology called ontology to define measurement constructs and exploring ways to leverage AI in measuring STEM literacy. Assessment of STEM literacy needs to be in multi-mode and multi-form; Rasch measurement provides a foundation for realizing multi-modal and multi-form assessment of STEM literacy.