**Assoc. Prof. Wan Zhihong, The Education University of Hong Kong, Hong Kong, China**

**Title:**

Toward more systematic application: Theory and Practice of SWEETIE AI-enhanced school STEM Learning Management System

**Bio:**

WAN Zhi Hong Peter is an Associate Professor at The Education University of Hong Kong, the President of the EASE (East-Asian Association for Science Education), and the Secretary-General of the GCASER (Global Chinese Academy of Science Education Research). Dr. Wan obtained his PhD degree from the University of Hong Kong. Before starting his research in STEM education, he had taught middle school science for 5 years. Cultivating STEM talent is a long-standing research interest of Dr. Wan with an emphasis on interdisciplinary STEM learning. He has published over 50 papers in prestigious international journals and led several significant research projects that address various key issues in STEM education, including blended STEM learning, the relationship between STEM learning and STEM career aspiration, the impacts of designed-based STEM learning, understanding the integration in STEM, and cultivating students with ADHD (Attention Deficit Hyperactivity Disorder) through STEM robotics. In recent years, Dr. Wan has been dedicated to promoting and implementing the educational philosophy of "STEM for All; STEM by All." The blended "SWEETIE" STEM curriculum that he designed and developed aims to integrate advanced teaching concepts with modern educational technologies, enabling all students to participate in STEM activities and all teachers to conduct STEM instruction. This curriculum has been well-received by primary and secondary school teachers and is currently being implemented in over 60 schools in Hong Kong.

**Abstract:**

Cross-disciplinary STEM education has become a focal point in recent educational reforms. However, there are two major barriers to advancing this initiative. One is the insufficient capabilities and confidence among teachers, and the other is the difficulties of catering learning diversity during STEM learning. To address these challenges, it is essential to leverage modern educational technology to establish online learning platforms that facilitate the transition from theoretical knowledge to practical application in STEM teacher training. Such platforms will alleviate the pressures teachers face while accommodating diverse learning needs Our ongoing large-scale project has already established a comprehensive STEM curriculum and developed systematic teaching methodologies, successfully converting 47 design-driven STEM activities into online courses via a learning management system (LMS). This online STEM curriculum are being successfully implemented in over 60 schools in Hong Kong.

Although the LMS has initially addressed the two major challenges in STEM education, several limitations remain: limited teacher-to-student feedback during learning; (ii) insufficient accommodation of learning diversity; and (iii) inadequate flexibility for cross-disciplinary learning, and (iii) inadequate flexibility and extensibility for cross-disciplinary learning. Recent advancements in high-performance and low-cost open artificial intelligence (AI) large model (e.g., DeepSeek) offer unprecedented opportunities to further enhance the LMS. The SWEETIE STEM LMS is harnessing the latest AI technologies to strengthen its functions through two key initiatives: (i) the development of a vertical AI model that enables students to engage in direct dialogue with intelligent agents throughout their STEM learning process, facilitating discussions about their ideas and the challenges they encounter; and (ii) the collection of data on students' learning characteristics to build algorithms that provide intelligent recommendations upon the completion of activities.

The integration of AI with STEM LMS represents a systematic approach to enhancing science education, distinct from the use of AI in individual learning contexts. In fact, generative AI embedded within the LMS can streamline multiple aspects of teaching and learning—from content creation and assessment design to automated grading of open-ended responses and data-driven instructional adjustments. Beyond the two initiatives outlined above, this presentation will explore additional future directions for AI-enhanced STEM LMS development.