

**A CONSTRUCTIVIST APPROACH TOWARDS TEACHING AND  
LEARNING MATHEMATICS IN SINGAPORE:  
RATIONALE, ISSUES, AND CHALLENGES**

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Enabling students to achieve a deep and connected understanding of mathematical concepts is an important aim in mathematical education. While current forms of instruction in the Singapore mathematics classroom can engender detailed expositions of a concept and links between targeted concepts and earlier concepts, much of this information is structured by the teacher and neglects the role of students' perspectives of the information that is transmitted to them. Constructivist perspectives of, which view knowledge as being constructed and not acquired (e.g., Fosnot & Perry, 2005; Piaget, 1977; Vygotsky, 1964), emphasizes the important role that students' prior knowledge play in the knowledge construction process. Learning designs that embody constructivist principles and pay attention to students' prior knowledge structures, such as the Japanese Open-Ended Approach (Becker & Shimada, 1997) and Productive Failure (Kapur, 2008, 2010), have shown promise in enabling students to have deeper understanding of mathematical concepts. Considering these, advancing the use of constructivist learning designs, particularly one that is sustainable, to various topics in a mathematics curriculum will be a worthy challenge in transforming mathematics teaching and practice in Singapore's already successful education system.

In this lecture, I will introduce the Constructivist Learning Design (CLD), a learning design that embodies constructivist principles and was introduced as a possible pedagogical approach to help deepen the conceptual understanding of selected concepts in the Singapore mathematics classrooms. I will first explain the rationale and review its tractability and efficacy in the Singapore mathematics classrooms. I will then identify the issues of implementing CLD in the classrooms and the measures we have introduced to mitigate these issues. I close the lecture to reflect on the challenges of sustaining the CLD among the teaching fraternity and propose some possible ideas that could sustain these efforts.

**References**

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