Call for Papers
Special Issue on *Computational Thinking Education*
The Asia-Pacific Education Research (TAPER)

**Curricular Reform for Computational Thinking Education in the AP Region**

Wing (2006) first introduced the term “computational thinking (CT)”, which involves “solving problems, designing systems, and understanding human behavior, by drawing on the concepts fundamental to computer science.” (p.33) From such a perspective, computational thinking is more than skills to be able to program, but also the skills to process information and the attitude that computer scientists generally hold to solve problems. More specifically, computational thinking involves several imperative thinking skills including abstraction and decomposition, thinking recursively, problem reduction and transformation, error prevention and protection, and heuristic reasoning which are needed to solve universal complex problems, not limited to software problems. Therefore, CT represents a universal set of skills that everyone from different disciplines; not only the computer scientists, should learn.

The importance of computer science education in the 21st century cannot be understated, as digital computing technologies have become an essential component of practically all human activities. National security, economics, public health and safety, for example, are key areas that currently and increasingly rely on advances in digital technologies, making it unsurprising that governments around the world have begun to prioritize computer science education for current and future generations of students. In the US, the International Society for Technology in Education (ISTE) and the Computer Science Teachers Association. (CSTA) provide plenty resources for “CT in K-12 Education” (e.g., teacher resources, CT workshops, and relevant academic activities; CSTA & ISTE, 2014). In Europe, a survey conducted by Ministries of Education revealed that 13 countries aim to develop students’ logical thinking skills and problem-solving skills through CT (Mannila et al., 2014). In Asian countries, CT becomes an emerging issue for pedagogical practices, research issues and policies (Jun, Han, Kim, & Lee, 2014). Due to their strength in the ICT industry, countries such as Korea, Taiwan, Hong Kong and China have launched national curricular reforms to address the current movement in CT education. For instance, the pervasive advocacy of equipping school students with computational thinking skills has just begun since late 2016 in Hong Kong (Education Bureau, 2016). In Taiwan, the new curriculum for CT education will be launched in 2019 to foster citizens’ learning/working skills that are needed in the 21st century (Ministry of Education, Taiwan, 2016).

The current curricular reform of computational thinking education in the Asian Pacific region expands to cover K-12 students. Due to the complex nature of computational thinking, the current enthusiasm toward computational thinking education may not lead to positive outcomes, if policies and implementation methods are not formed with appropriate considerations of the unique culture in the region. The questions such as at what age children should start to learn computational thinking skills, how computational thinking should be integrated with existing curricula, what is the impact of the early computational thinking education on students’ cognitive development and their influence on motivation, should be examined through theoretically and methodologically rigorous approaches. This special issue, therefore, intends to provide insight into the current curricular reform of computational thinking education in the Asian Pacific region, hoping to shed light on the policies and implementations of CT education in the region.

Particularly in the Asia Pacific region where the government, education, and economic development landscape is complex and rapidly changing, it is important to understand how computation thinking tools and practices are currently used in classrooms and how the government policies and initiatives have been supporting computational thinking education. The trajectory of CT education in the countries in the region highlights that CT research in the Asian context needs to consider the complex multi-faceted factors within and outside the education systems such as

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**SUBMISSION GUIDELINE**

The submissions must not have been previously published or be currently under consideration for publication elsewhere. Please feel free to contact the editors with any questions.

**IMPORTANT DATES**

- Full paper submission deadline: **November 30, 2018**
- First round review result: **January 31, 2019**
- First revised manuscript: **March 31, 2019**
- Second round review result: **May 31, 2019**
- Second revised manuscript: **July 31, 2019**
- Third review & final decision: **September 30, 2019**
- Final version submission: **October 15, 2019**
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gaining parental supports, teachers’ buy-ins, redesigning teacher preparation programs and changing assessment approaches. Therefore, this special issue aims to provide an academic platform for researchers to identify and discuss complex and unique issues that Asian education systems have been facing with cultivating CT.

The following issues are particularly pertinent to examine in the scope of this special issue:

1) Education policies and initiatives that support and impede computational thinking education,
2) Challenges and barriers that must be overcome to improve computational thinking education, especially with respect to teaching and learning pedagogy, and
3) Contextual factors that should be taken into account with respect to tools, local communities, and institutions that affect computational thinking education programs.

The topic areas to be covered

This special issue aims to expose the recent evidence-driven research findings and development in implementing computational thinking education that may shed light on the policy and implementation of CT education in the Asian Pacific region or other regions that may shed light on the implementation of CT education in the Asian Pacific region. Possible topics in this special issue that papers may address include (but are not limited to):

- Theoretical analysis of computational thinking
- Pedagogy for cultivating computational thinking
- Assessment of computational thinking
- Curriculum design and evaluation of computational thinking
- Computational thinking in online communities
- Computational thinking in maker activities
- Computational thinking and games
- Computational thinking without computers
- Psychological aspect of computational thinking
- Collaborative learning and creativity for computational thinking
- Teacher perspectives of promoting computational thinking in school
- Teacher facilitation in the construction process of students’ computational thinking
- Innovative approaches on teacher training and professional development in computational thinking education
- Policies for the implementation of computational thinking education

Submissions

Manuscripts should not exceed 6,000 words. All papers will be peer reviewed based on quality, originality, novelty, organization and clarity of writing, and evidence provided for assertions and conclusion. Please refer to the ‘Instructions for Authors’ at http://www.springer.com/40299. Papers submitted for this special issue must not be submitted or are under consideration for publication anywhere.