

# Computational Thinking in the Singapore context

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## Introduction

With the increasing worldwide emphasis on Computational Thinking (CT), there is an urge for the Ministry of Education of all the countries to prepare their students to be future-ready. Singapore is no exception. Furthermore, with the recent facebook post of the Sudoku code posted by the current Singapore Prime Minister, coding has also received much attention in the Singapore context.

## Questions arising

With the recent events, several questions arose: (1) How should CT be introduced to students – as a new subject in the school curriculum or infusion into existing subject curricular? (2) Must CT incorporate coding? (3) How are teachers prepared to teach coding and CT?

## CT and coding in Schools

It appears that at the current phase, there is no indication of introducing CT as a new academic subject, but more likely an infusion in the existing school curricular subjects. Some subjects, such as mathematics, lend very well for infusion of CT. For example, in mathematics, CT can be understood as a problem solving paradigm of mathematizing a problem in such a way that the computer can execute it. In this way, it seamlessly fits into the problem solving framework of the Singapore mathematics curriculum.

There is evidence in the Singapore schools that coding has been introduced to both primary and secondary levels. In particular, schools engage their students in awareness of coding through engaging them in “enrichment” activities. There was not much evidence of direct involvement in teachers who might not be familiar with coding and CT.

From the nature of coding, it seems that the underlying nature of coding fits the nature of mathematics, which emphasizes the logical deductive thinking. Thus, an experience of coding is not so much of learning many programming languages but more on appreciating the logical deduction.

## **Teacher Preparation in Singapore**

Much work has been initiated in the National Institute of Education (NIE) Singapore in driving the area of teacher preparation. Currently, all mathematics student teachers pursuing their degree in NIE are required to read a module on Computational Mathematics, in which students will experience some programming language in the context of language. The mathematics pedagogical courses in the NIE raise students' awareness of CT and coding and, in the near future, it will become an assessable component of the course requirement.

## **Education Research on Computational Thinking**

With the generous funding of the NIE, education research projects have been initiated by academic staff to study the enactment of CT in classroom lessons, the efficacy of various innovative practices in teaching CT and coding in the classrooms. Much work are in the pipeline.