Information System Framework for Training Teachers on Computational Thinking

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Abstract **– The call for a holistic integration of computational thinking (CT) skills across all subjects in the newly revised Malaysian curriculum of 2017 has brought to attention an urgent need to prepare teachers with the new syllabus, teaching and learning (TL) tools, and techniques, to promote effective computational thinking knowledge dissemination in their daily classroom practices. However, a preliminary investigation revealed that many teachers were still unaware of the changes within the new curriculum. There was an apparent lack of understanding of computational thinking skills in general. The study intends to propose a conceptual framework to develop knowledge about computational thinking skills among Malaysian teachers, to enhance their pedagogical repertoire to include elements of computational thinking into their teaching content. The study employs mixed-method research to capture data and construct interventions. The Information Systems Design Theory (ISDT) is used to design an effective information system (IS) and set a plan for developing the conceptual framework. The proposed framework comprises five elements, which could serve as a guide for future planning in setting up CT training for Malaysian teachers and other related professional development programmes.**

Keywords **– computational thinking, information system (IS), E-learning, teacher, Information System Design Theory (ISDT).**

1. Introduction

Computational thinking (CT) is a fundamental skill for 21st-century learning [1], perhaps even in the 22nd century. CT skill is essential, capable of producing graduates equipped with critical skills for futuristic careers. As a result, many countries are incorporating CT concepts into their educational curriculum. Malaysia joins the bandwagon, as it claimed to be the first country in ASEAN to pioneer in the use of CT into its national education system; Malaysia does not only introduce CT for programming or computing based subjects, but its elements are incorporated into all subjects, including literature, art and health. Implementing newly integrated curriculum reflects the need to equip Malaysian educators sufficiently with CT knowledge, to enable a smooth integration and interpretation of CT into content knowledge.

Since 2016, professional development programs have been conducted to understand the CT definition among teachers. However, in a small cross-sectional study [2], findings indicated that most teachers were unaware of the inclusion of CT skills in the revised curriculum for 2017, resulting in the absence of using CT elements in their instructional delivery. The teachers who participated in the study also indicated a lack of understanding of CT. The results sent alarming consequences, as they depicted an actual scenario in the classrooms. Without expertise and sufficient knowledge, teachers would not have been able to integrate CT skills into the subject contents they teach. Stemming for the concern, the study aims to investigate the viability of designing an Information System (IS), which would aid teachers to gain understanding and acquire mastery in integrating CT in their respective classrooms.

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