Are Computational Thinking Skills Measurable? An Analysis

Loice Victorine Atieno[a],Richard Kwabena Akrofi Baafi[b],Marta Turcsanyi-Szabo[c]

[a]Eötvös Loránd University
atienomunira04@gmail.com

[b]Eötvös Loránd University
richbaafius@gmail.com

[c]Eötvös Loránd University
tszmarta@inf.elte.hu

Abstract

Studies have revealed that acquisition of digital literacy constitute not only knowledge on the use of software and or hardware but also knowledge of sophisticated skills - cognitive, motoric, sociological and emotional skills- which are required for one to function effectively in this era. These skills basically describe what constitute Computational Thinking (CT) skills. It is therefore important not only to enable learners acquire these skills but also assess their competency in the use of these skills. Studies indicate adoption of CT activities in the current curriculum in many countries unfortunately with no assessment tool that can comprehensively assess these skills. With the assessment of CT skills being identified as critical and still open to research, this paper therefore presents an analysis of various assessment tools and systems and use of customized Digital Literacy Competency Calculator (DLCC) framework in assessing CT skills. The study was conducted among first year computer science international students with no or basic programming skills. To build students' confidence in programming, Scratch programming language was used to develop projects and the content was delivered using design-based approach. The course syllabus was structured in themes and with projects demonstrating students' CT skills as deliverables. The use of DLCC framework demonstrated a systematic way of assessing the competency of the CT skills learnt based on the activities, processes and projects. The results of the study showed that as the students progressed with the course their competency also increased. Based on this study, DLCC has proved its capability in assessing various CT skills and their level of mastery.

Keywords: Computational Thinking Skills, Digital Literacy Competency Calculator, Assessment, Assessment tools, Analysis