

1. How secondary school girls perceive Computational Thinking practices through collaborative programming with the micro:bit (Open Access)

Shahin, Mojtaba (1); Gonsalvez, Christabel (1); Whittle, Jon (2); Chen, Chunyang (1); Li, Li (1); Xia, Xin (1)

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Author affiliation: (1) Faculty of Information Technology, Monash University, Australia (2) CSIRO's Data61, Clayton, Australia

Abstract: Computational Thinking (CT) has been investigated from different perspectives. This research aims to investigate how secondary school girls perceive CT practices – the problem-solving practices that students apply while they are engaged in programming – when using the micro:bit device in a collaborative setting. This study also explores the collaborative programming process of secondary school girls with the micro:bit device. We conducted mixed-methods research with 203 secondary school girls (in the state of Victoria, Australia) and 31 mentors attending a girls-only CT program (OzGirlsCT program). The girls were grouped into 52 teams and collaboratively developed computational solutions around realistic, important problems to them and their communities. We distributed two surveys (with 193 responses each) to the girls. Further, we surveyed the mentors (with 31 responses) who monitored the girls, and collected their observation reports on their teams. Our study indicates that the girls found "debugging" the most difficult type of CT practice to apply, while collaborative practices of CT were the easiest. We found that prior coding experience significantly reduced the difficulty level of only one CT practice - "debugging". Our study also identified six challenges the girls faced and six best practices they adopted when working on their computational solutions. © 2021 (127 refs)

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