

Tackling Abstraction through Situated Learning Practices in Introductory Computational Thinking Skills with RIO

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Research Problem

Computational Thinking

Automation of layers of abstraction

Finding computational potential in everyday life

Simplification

Decomposition

Reducing details

Alternate Representations

Generalization

Connection

Challenge

Imaginary contexts make it difficult to achieve abstraction

Save battery



Burglar Alarm



Authentic Real-life situated Problems

Engagement with Programming tasks for Real-world IoT Objects

Proposed Solution

situated Outcomes

Pedagogy

Mentor and learner solve problems together using situated learning

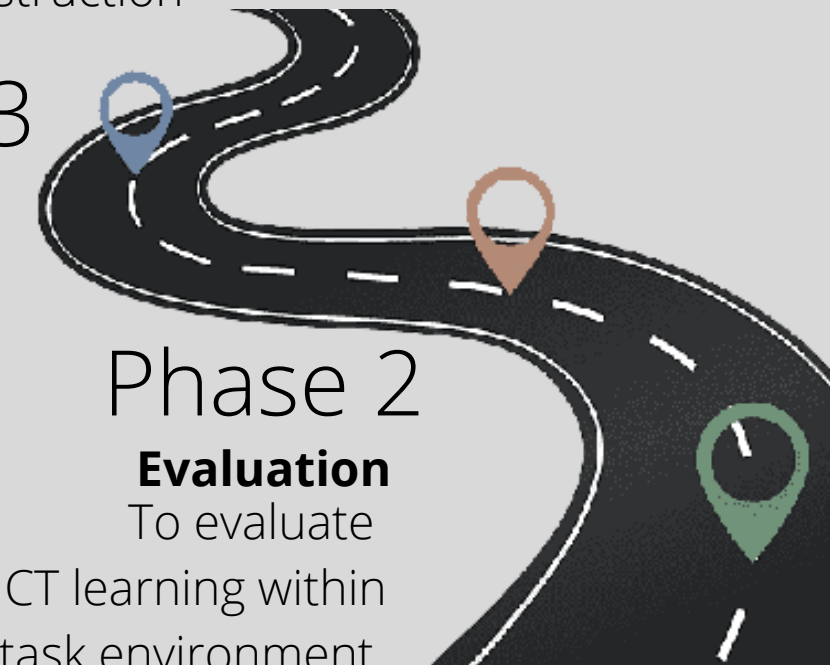
situated tools



Research Method

Guide the framework for CT related situated activity construction

Phase 3



Phase 2

Evaluation

To evaluate CT learning within the RIO task environment

Phase 1

Exploratory Pilot Study

To evaluate the task environment with RIO

Real-world Internet of things programmable Objects and off the shelf smartphone applications are used in an in-person setting with individual middle school learners, collaboratively with a mentor and in order to understand and unravel the embodied cognitive processes, conducive discourse practices and nature of problems.

With the broader research objective of exploring the impact of Programming-RIO on participants' problem solving with computational tools, our specific research objective is to explore participants' computational problem-solving process when they design automation solutions using IoT objects in the real world, using platforms like IFTTT, Google Home app, and Alexa app.

Publication:

Programming-RIO: Initiating Individuals into Computational Thinking using Real-world IoT Objects Workshop on Embodied Cognition, ICCE 2021 (Accepted)