

An Investigation of a Game Generator Tool to Teach Recursion

Abstract

Learning programming is difficult for most students. Particularly, the recursion topic. Although games have been proposed given their motivational impact, developing educational games is difficult, expensive and time consuming. In this project, a game generator tool is proposed to support non-technical experts (teachers) to create serious programming games. We expect to find out the effectiveness of using the tool by teachers.

Objective

This research investigates the effectiveness of using a game generator tool by teachers to create games to teach the recursion topic.

Research Questions

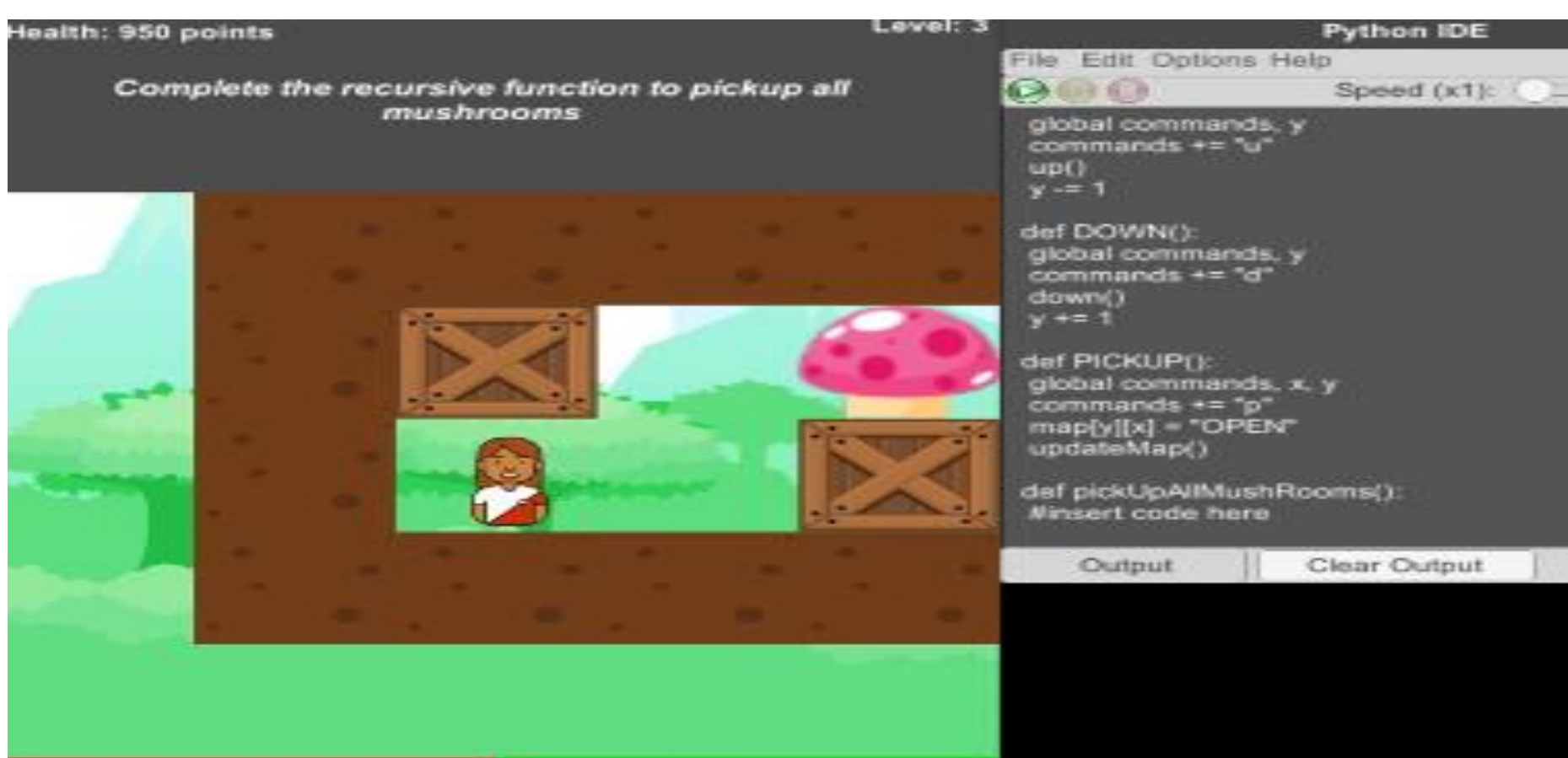
RQ 1. What conceptual attributes must the generator tool take into account in order to generate a game that can teach recursion?

RQ 2. How effective is the use of a generator tool in creating customised games to teach recursion?

Methodology

The study employs user centered design approach to develop a game generator tool. This is followed by a usability evaluation with introductory programming (CS1) educators through three experiments: (i) online experiment with 30 participants from Kenya and South Africa; (ii) Large scale online study with CS1 educators globally, and (iii) a controlled lab experiment with trainee programming teachers.

Sample generated game



Experiment 1 Results

- Tool allows teachers to quickly create serious games
- Educators are satisfied with the tool and want it at their work place (81%)
- Tool useful (87%) and easy to use and learn (80%)

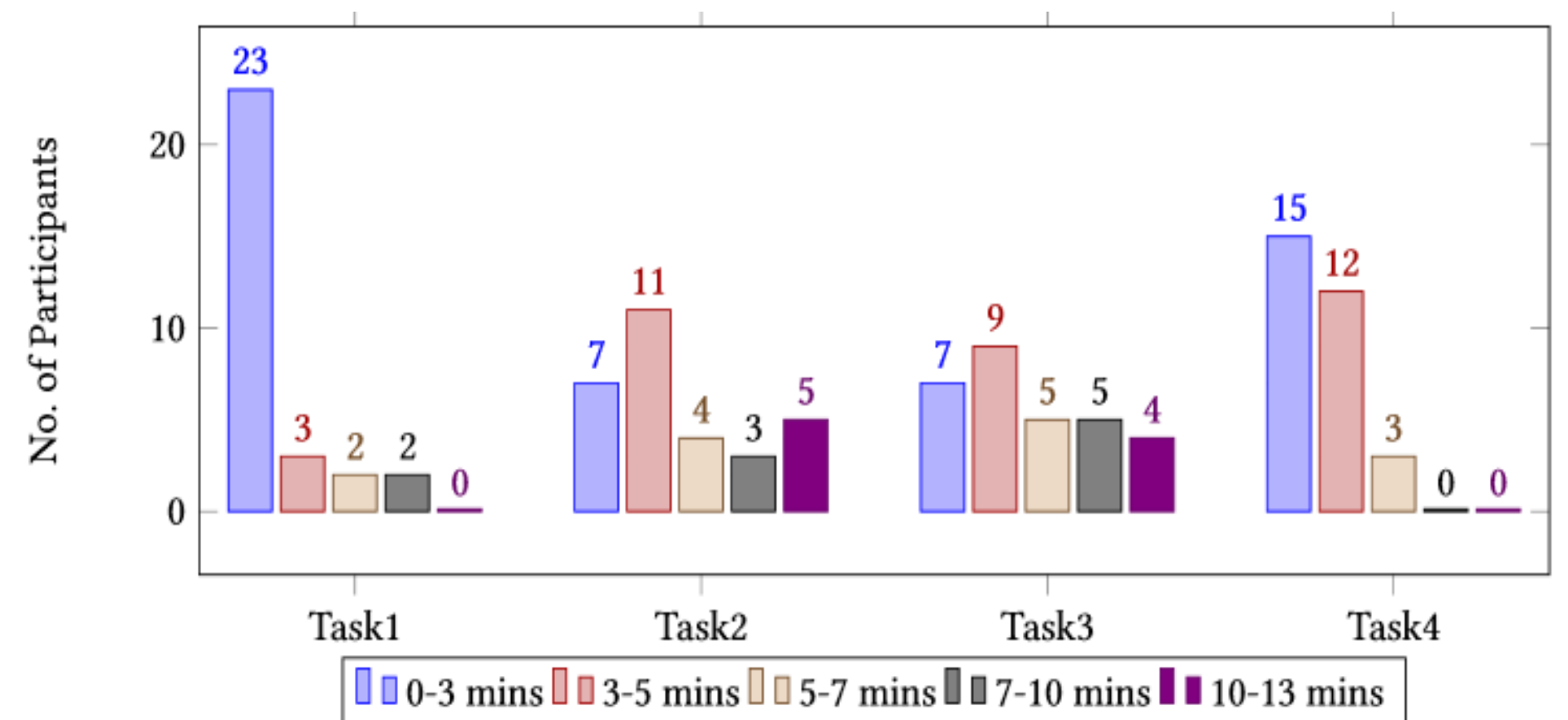


Figure 5: Estimated Time on Task Rating

Table 5: RGG tool Useful Features

Feature	Rank	Mean	SD
Download	1 st	4.50	0.51
Generation	2 nd	4.30	0.84
Help	3 rd	4.17	0.87
Customisation	4 th	4.10	0.80
Login	5 th	3.97	0.96

Current and future work

Running experiment 2. Next, we will design and evaluate experiment 3.

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