Informal learning is a research area not fully explored yet [1], but interest in out of classroom learning methods and settings is currently increasing [2], [3]. In parallel to that, the advent of Internet, which allows for a plethora of educational content to be widely shared, seems to be promoting self-directed learning for all ages. Furthermore the rapid technological advancement makes obvious the need to identify opportune times and methods for technology and computer education, starting probably from the very early ages [3] and [4].

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This paper presents improvement suggestions after children and teachers piloted a self-teaching programming using an interactive application developed by our research group. The application presents a curriculum that introduces fundamental programming concepts and algorithmic thinking to early elementary school students. The teaching approach is based on parallel use of the self-teaching application, and use of the “Scratch” platform that allows for interaction and experimentation with fundamental but also more advanced programming concepts [5]. The application is interactive, and in parallel with teaching, offers the students developmentally appropriate rubrics for self-assessment [6].

The curriculum proposed, consists of 10 educational modules that address fundamental programming concepts, namely the concepts of algorithmic thinking, well-structured problem solving, assignment of variables, creating of logic diagrams, use of sequential, conditional and repeated instructions, testing and debugging. Every educational module consists of an audiovisual introduction to a game scenario and the Scratch modules the children will need to use, one step-by-step solution to the problem, and introduction to a similar game scenario that addresses the same programming concepts as the initial scenario, a self-assessment rubric for the child to use, that again uses developmentally appropriate form of questions and visual elements and requires Yes/No answers.

The application was initially developed and piloted as an afterschool activity by 12 3rd graders in an elementary school in Greece [2]. Following that, two 3rd grade teachers also implemented the application in class during regular class hours.

REFERENCES


