



Science simulation development with Scratch

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Short Presentation

This study focuses on exploring the use of Scratch for constructing science simulations with students of Senior High School in authentic classroom conditions. We attempt to contribute to the discussion on the main parameters of planning, developing and implementing an effective constructionist approach aimed at engaging students in simulation development as an interdisciplinary project. Building upon earlier researches we implemented alternate teaching strategies as simulation development from scratch and use of preconstructed Scratch projects in order to support student inquiry and learning with models in science. The proposed activities are characterized by a gradual increase in the complexity and difficulty degree and functions as scaffolding during the gradual familiarization of the students with Scratch. In the process, we observed how the students build, test, revise and remix models, collaborate and elaborate concepts developed in previous programming activities, in order to deal with more complex problems. In this study, we report findings of the classroom research aiming at shedding light on 16 year-old students' construction processes as they worked with Scratch. We describe the basic characteristics of the overall process and highlight the differences in the students' levels of engagement and performance. We present students' skills, attitudes and views concerning the use of Scratch for science simulation development and indicate some special features of the programming environment that contribute to or cause difficulty in the creation of an effective learning environment.

The suggested approach was pilot implemented in the framework of the "Project" course in a class of the 1st grade of A' Arsakeio General Senior High School in Athens, Greece, during the first four-month period of the school year 2011-2012.



Figure 1. The Scratch environment, sample projects, and sample blocks stack of the students' work.

Keywords

Scratch; constructionism; programming; science simulation