

Elementary Education in a Technology Age

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Abstract

Technology becomes more advanced and more accessible with every passing day. Education should be utilizing this technology boom in teaching current students. However, this does not seem to be the case. The goal of this project is to try and implement computer programming, through Scratch, as a tool for educating students. Computer science education at a younger age becomes more and more essential as computers become more advanced and more accessible with each passing day.

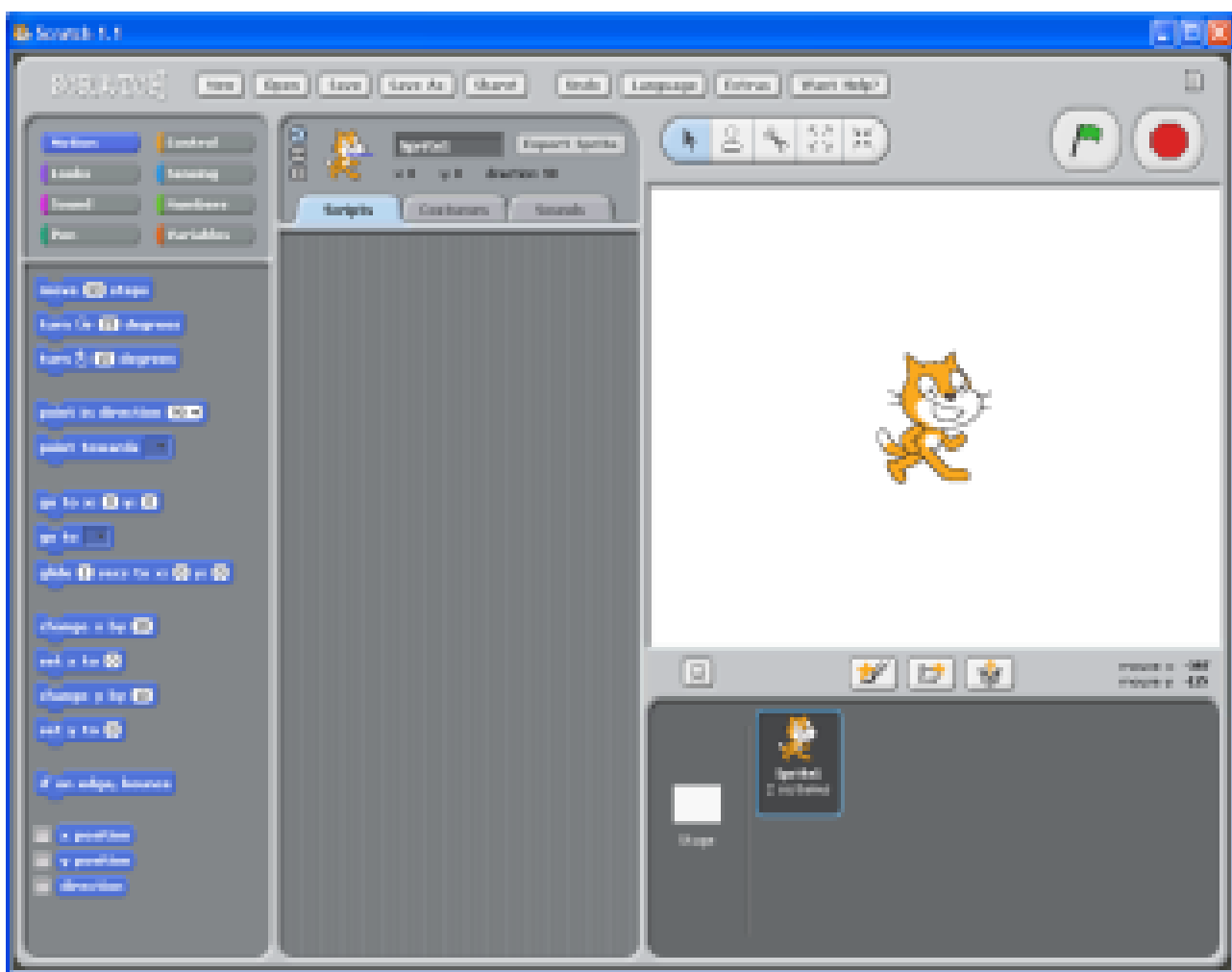


Background Information

The task of educating the younger generations about programming has been attempted before. The first attempt to create a kid-friendly programming language was Logo, made by Wally Feurzeig and Seymour Papert. This programming language mainly involved telling a turtle how to move around in order to make various pictures with the turtle's "pen." Since then, multiple programming environments and languages have come about to try and engage not only youth but also girls in computer science and programming such as Squeak, Alice, and Scratch (Papert, 1993).

Despite the bountiful number of tools that modern technology gives us for teaching students, little progress has been made for teaching computer science at the elementary school level. The necessary technology is present in the schools, but it is only being used to reinforce outdated teaching methods. Currently, computers are mainly being used as a medium to transfer information, much like a television. Computers have so much more potential than that. They should be used as a universal construction material, not as a TV screen. Programs like Scratch enable kids to create whatever they want to all by themselves. Children learn better by immersing themselves in whatever they're doing, rather than just listening to a teacher telling them what to do (Papert, 1993).

The goal for this project is to establish something akin to a Compute Clubhouse at Cardinal Forest Elementary School. The original Compute Clubhouse was started by the Massachusetts Institute of Technology in Cambridge in 1993 to "provide more young people with the opportunity to become digitally fluent" (Resnick, 2002). At these clubhouses, kids and older youth "become designers and creators with new digital technologies. Clubhouse members use leading-edge software to create their own artwork, animations simulations, multimedia presentation, musical compositions, websites, and robotic constructions." (Resnick, 2002)



Implementation

Students from first through sixth grade meet in the "Cardinal Computer Lab" at Cardinal Forest Elementary School every Thursday sometime between 11:00 AM and 2:00PM. Each class lasts for 30-45 minutes depending on the age of the kids in the class and the schedules that the teachers have laid out. The tech specialist at the elementary school and I alternate the weeks that we teach. Topics that have been covered thus far include: the coordinate axis, x-y coordinates, angles and degrees, if-then statements, basic loops, custom sprite/stage creation, and sprite interaction. Obviously, the topics include more than just computer science.

For the first three months Mr. Allard (the tech specialist at the elementary school) and I spent a majority of the lesson time teaching the students and walking them through a simple project. The end goal is to give the students a broad category or theme (i.e. celebrations or sports) and let the students create their own projects. We have recently entered this "individual work" phase. By letting them work on their own, we hope to increase not only the students' creativity but also their independence. If the students teach themselves and work through problems on their own, they will have a better understanding of the subject matter.

Lastly, group projects will be given to promote teamwork amongst the students. These children come from many different classes and grades and they don't know each other very well, so getting along initially may be difficult. However, working in teams is an essential skill not only for computer scientists but in any job and our goal is to give these students a strong foundation for working in groups in the future.

Current Situation

Students have finally begun to work on their own individual projects, and a couple of them even claim to be finished! After taking about a two week break from any specific teaching, I introduced the Scratch-unique concept of broadcasting to the students in order to aid them in the creation of their programs. A majority of the student programs, rather than being user-interactive, try to tell a simple story or depict a simple interaction scene between a few sprites.

