Computer Science Courses in Florida Elementary Schools

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Audience Scenario

The target audience for this research proposal is the Florida State Board of Education. The Florida State Board of Education is responsible for developing and maintaining the Standards and Curriculum for Florida state elementary schools.

Abstract

The research question of this study is to analyze the need for computer science classes in elementary school curriculums. There is a dire need for scientifically minded and computer-literate professionals in tomorrow's workforce to lead future generations. We can achieve this by upgrading our elementary school curricula to include computer science courses to expose children to the technical world at an early age. These curricula should mirror the important role computer science plays in our daily lives and serve to enhance and improve the competency level of children and form a foundation to improve critical thinking skills.

The most important thing to be introduced in these classes is computer programming, also referred to as "coding." With the introduction of coding, you are building a base for computational thinking. This, in turn, will allow elementary school-aged kids as young as five to grasp concepts like algorithms, context, breaking up complicated problems, and collaboration. The ultimate goal should be to introduce the computer not as a toy but as a useful tool that can be harnessed to work for them.

Introduction

Should children be taught computer science in elementary school? The grade five Florida math standards require students to be able to use brackets and parentheses to generate expressions without evaluating them (Mathematics Florida Standards (MAFS) Grade 5 1-7). These concepts lend themselves perfectly to working with algorithms, a skill developed with computer science education. Many people may not realize that computer science education goes beyond just career development. "For kids just entering school, teaching CS is about giving them the thinking skills that will help them become proactive learners and citizens — as opposed to just consumers and denizens — in a world that's increasingly influenced by the manipulation of the digital bit (Yongpradit & Schwartze, 2014)." We will require individuals who can think like programmers and system modelers, regardless of

whether they are building a cellphone application or solving issues in a third-world setting.

Incorporating computer science courses into elementary school curriculums is not without its criticisms. Time constraints are a big factor in the classroom, and adding additional competencies can take away from students' primary educational goals. Funding is also an issue in both the design and implementation of such a program. Infrastructure upgrades to improve internet connectivity or school computer systems must be factored into the cost (Yongpradit & Schwartze, 2014). These issues cannot be ignored and must be engineered around in order to provide a useful curriculum that best prepares students for the future.

This research paper seeks to outline the benefits of introducing computer science courses to Florida's K-5 curriculum, as well as expand the courses offered in the 6-12 curriculum. This research will outline available tools and resources as well as current models from other state school districts. Additionally, this paper will seek to acknowledge and address common criticisms and concerns with the addition of CS classes to elementary school curricula.

Review of Research Literature

If we take into account the argument that why schools have not started teaching computer science courses at the elementary level, we might have to consider the fact that educationists have no evidence about the consequences of teaching computer science at the elementary school level. This question is significant in a way that many schools are still not convinced about the importance of teaching computer science at the initial stages because they fear that the outcome can also be negative. We can get to know about the consequences of teaching computer science by considering any new course being taught at the elementary level and then comparing its results with our approaches.

It is important to teach the students computer science at the initial level so they can have a better understanding of the computer course once they reach middle school. A researcher and a professor, Jasmine Ma, who teaches technology at NYU, was recruited to overlook the computer science activities being held in schools. There, she was asked a question: why is teaching computer science important at the elementary level? According to her, as the world is rapidly undergoing digital transformation, it has become significant to teach children about computer science as she thinks that the civic engagement aspect has its own importance. She says that children should be taught computer science at the elementary level so that they can contribute to the betterment of society and take rational and logical reasoning. She thinks that a computer course allows children to think logically and to be creative so they can protect themselves in this rapidly changing environment.

When the Logo movement took over the education sector in the 1980s, kids were taught computer science courses back then. Now, people have realized the significance of teaching computer courses again in K5, and thus, this idea is being implemented with a number of teams working on this project

like code.org and ScratJr, which offers programming and coding courses for the students (IST.com) Another elementary school educationist Beth Schwartz (IST.com) was asked with the question about whether computer science should be taught in schools at the elementary level or not.

According to her entry, level education must not focus on teaching computer science more than just teaching the introduction to computer science. She thinks that it is the time for teaching numeracy and literacy, whereas middle school age is particularly most appropriate for teaching algorithms, coding and other software engineering skills because children will have a better understanding by the time they reach that age. In April (2007) a researcher, Lynn Lamberth, performed research on whether science such as computer science should be involved in the curriculum at the elementary level and found out that to energize enthusiasm for software engineering, they went to three fourth-grade classes once per week for thirty minutes every (three substance sessions and a pretest and post-test session) in March-April 2007. The reason for the exercises was Computer Science Unplugged. Pre and post-tests demonstrate enhanced certainty and enthusiasm for Computer Science and Math.

If we talk about how rapidly computers are entering classrooms, we can clearly see that during the 1980s-1990, many schools changed their focus from ordinary teaching to computer-based teaching, and that yielded positive results. Although they had not started teaching computer courses specifically bringing the computers in the classrooms depicts how beneficial computers can be. Research was conducted to see whether the students showed a positive attitude by introducing them to computers, and the results were astonishing. Children were more productive when they encountered computers, and hence, they realized that computers are not only meant for playing games but different academic goals can be achieved using this machine.

Research Methods and Timetable

At this time, I expect all of my research to be secondary in the form of published articles covering this topic available on Google Scholar and Hunt Library. The Florida State Board of Education has the Florida state educational standards available freely on their website, along with other pertinent information such as their budget. I will attempt to collect primary research by interviewing the office of the Commissioner if available (https://www.fldoe.org/contact-us). Research methods that will be used would be taking interviews with the parents as well as teachers and conducting focus groups to understand the learning capabilities of the children learning about computer science. To bolster their interest in the subject, children will also be asked questions based on the survey to understand the level of computer science courses being taught to them. Since it is a quantitative study, results will be analyzed through SPSS, whereas the responses of the teachers and parents in focus groups will be analyzed using NVIVO.

Apr 23rd	Hand in the report.

Apr 16th	Finalize Report. Dead Reckoning.
Apr 9th	Rough Draft Due. Last chance for major revisions.
Apr 2nd	Finalize the front and back matter of the paper. Prepare to finalize the rough draft.
Mar 26th	Finalize tables and figures. Verify sources cover everything I need and are all relevant. Prepare front and back matter for class.
Mar 19th	Decide on tables and figures. Finalize body structure and flow.
Mar 12th	Find and collect more references with hard data points and finalize the outline.

Conclusion

When designing school curricula, it is important to consider the workforce that future students will enter. Computer science courses already cover the traditional computing and programming occupations, however, the skills learned in these courses transfer to all areas of our increasingly digital world. This research paper will show the clear need and tangible benefits of introducing computer science courses to the Florida State elementary school curriculum. With this research, the Florida Board of Education can propose appropriate changes to school curricula to better prepare Florida's youth in a rapidly digitizing world.

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