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Period 2

Project Proposal 1st Quarter 2008

Computer Systems Project Proposal - September 2008

1. Title (or subject area) of the project

Computer Education

2. Purpose and scope of the research project

The goal of this research project was to provide students at Cardinal Forest Elementary School with an education about computer programming using Scratch. The program was used to investigate whether there is specific type of child that benefits the most from an education in computer programming. For example, some children are very shy and work by themselves, while others are more talkative and willing to ask their classmates for help. Does this computer science program help the shy children learn the value of getting help from their peers, or do the more rambunctious children benefit more because they learn that they need to listen to the teacher's directions? This information could be used to decide which students will benefit the most from the Scratch program in the future years. If there was a way to measure the benefits of computer science on the children, the program could be geared toward helping the children who need it the most.

3. Background and review of current literature/research in this area.

There has been some research in the areas of computer education, particularly by Kylie Peppler and Yasmin Kafai who have written dozens of papers regarding computer education. The Scratch program's goal was to develop the programming skills of the children at Cardinal Forest and help them become fluent in technology by creating their own 'computer culture.' Peppler and Kafai's paper "Seeds of a Computer Culture: An Archival Analysis of Programming Artifacts from a Community Technology Center" provided evidence that students eventually realize that in order to create more advanced projects, they need to work together and ask for help. The paper "Creative Coding: Programming for Personal Expression" discusses the the importance of connecting art and computers. Because Scratch is a program that can be easily used to create a multimedia presentation, students can make projects that express themselves and the curriculum should encourage the students to do just that. Greg Gates, a student who graduated from TJ last year, did research in computer education by creating the Scratch program at Cardinal Forest. Because the program was developed by Gates, his research was particularly insightful. He worked with the students at Cardinal Forest Elementary School and decided to research whether the children would be able to learn how to program. Gates concluded that the children became more technically savvy as the year progressed and the children became more interested in computer science, and technology in general.

4. Procedure and Methodology.

By using Scratch, a program developed by MIT, the students of Cardinal

Forest Elementary School will be taught basic computer science skills and problem solving techniques. Each week, curriculum was developed to be taught during the Thursday class sessions. Using the knowledge gained through the curriculum, the children will become more familiar with computer science and will be able to create their own programs. The Scratch program should hopefully influence the student's progress in other academic aspects and in order to measure the amount of benefit the Scratch program has on the children, a survey will be created for the students' teachers to fill out. The survey will measure the students learning style and ability and it will be completed again at several intervals during the year to see if any changes in the child have occurred.

5. Expected Results & Value to Others

It is likely that shy students will benefit the most from Scratch because they will need to learn to work together and ask each other for help. These reserved students will need to go outside of their comfort zone if they want to finish their programs and learn the techniques needed to do so. As the computer class teaches these students the value of teamwork, hopefully they will apply this knowledge in their other classes and it will be evident that they are more open to working with others. Teamwork is a lifelong skill and it is never too early to learn it; if this Scratch program is able to help students benefit in the long run, it will be easier to convince other schools to implement computer courses in their curriculum. The more outgoing students will also benefit from the computer science program because they will learn that, instead of talking when the teacher's talking, they need to listen if they want to learn how to complete their program. As the students begin to understand the importance of listening to directions, they should be able to apply this knowledge to their other classes and they will learn more effectively. Furthermore, as computers become more integral to everyday life and younger children are required to manipulate technology, it is more important for children to learn more about technology. Using computer science, children can learn more about what makes their electronic devices work, and can also learn how to problem solve and manipulate coding to make their program do what they want it to.