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Math Education Website

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Senior Honors Project Analysis and Reflection

For my senior honors project, I worked with Dr. Heather Booth from the computer science department. When I first started working on this project I envisioned creating a web site comprised of mathematics tutorials that high school level math students could use when they needed additional assistance with a specific mathematics topic. However, as my project progressed, it grew into something slightly different. I began the project thinking I would create all of my math tutorials using Adobe Flash. At the time, Flash seemed to lend itself to the types of tutorials I envisioned. For certain topics, I can see how Flash would be the best choice. The unique way Flash allows developers to move objects around the screen could be very beneficial for certain lessons, however, I eventually came to realize that Flash is not always the most effective medium for a math lesson. For me, it took much longer than I had anticipated to create a single Flash lesson. If time was the only matter of concern, I might have been more tempted to continue with it. As I worked with it more I would become more versed in its nuances and be able to create Flash tutorials more quickly. However, I also began to ask myself if Flash was the most effective way to teach a math concept. I spent some time discussing this matter with Dr. Booth, and together we planned a new way to put tutorials on the web without the use of Flash. This new approach involved the use of HTML, JavaScript, and CSS. One aspect neither Dr. Booth nor I liked about many of the online math tutorials we found was that they would span several pages and contain so much text it was intimidating and discouraging to look at. The new method still offered as much information, but instead of displaying it all at once, most of the information remains

hidden until the student selects to read that section. Additionally, each section has a question to go along with the step that is being explained. Dr. Booth and I both agreed that having some form of assessment throughout the lesson would greatly improve retention. Also, for each question throughout the lesson, I built in hints and solutions so that students can view one or more hints to help them determine the correct answer to the question. If the hints are still not enough, I offer the solution, which of course remains hidden until the student clicks to view it.

This final model seemed the most effective for math instruction. It still included all the information necessary for a student to learn a concept, and it takes significantly less time to develop than a flash animation. Also, the inclusion of questions throughout the lesson really seems to bolster understanding. Even though my project is now over, I have started work on a program written in PHP that would take various pieces of information such as the steps for a mathematical concept, some questions, answers, and hints to go along with it and with the click of a button it would turn this data into a web page. When I complete this tool, it could be very useful to me (and other teachers) when I am a teacher and want to develop additional help for my students.

This project was a great learning experience for me. I have learned that the flashiest and coolest approach to teaching mathematics is not always the best. In my case a simple web page with JavaScript seemed more effective and easier to create and maintain than a Flash animation. I look forward to further developing these tools and using them with my class when I become a math teacher.