Marquicha Green

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Component 4: Project Design Specification and Evaluation

1. Overview of problem and solution, with research-based evidence that you’re computing for social good solution: a) addresses a problem of social good, b) your solution has the potential to address one facet that could potentially address the problem of social good and c) has considered possible consequences. Your overview should cite research articles and other sources.

From fifty feet the issue at hand is property. A centralized overview would be the lack thereof Computer Science education in low-income communities. Many schools in these unserved areas have little to no C.S education implemented into their curriculums. In today’s world where we know that technology and data play such large part into our everyday lives, it is kind of wild to imagine that any school system could be lacking in this education. However, we are still struggling to effectively expose many children to these particular studies. Which in turns, plays a role in the lack thereof of this demographic having a much less footprint, involvement, or voice in the computer science (tech) industry, which career median salary is $38,640 greater than other occupations according to Applied Computing University of Wisconsin. Moreover, a study performed by DePaul University’s summer data science academy for Chicago Public School high school students the results proved promising. Where the by the end of a weeklong program the rates from students interested in a computer science related career increased from 65.4% to 91.7%. This study showed the possibilities to what of what just exposing students to computer science have on their interests and overall learning. My solution is to take it a bit further. I think that computer science should be exposed to students in grade levels starting at kindergarten, so that by high school grade level students would have a been groomed in certain concepts. No COMPromise Learning will be a seamless, creative, effective way to have students open to the endless possibilities that a career in the tech industry can offer. With all programs comes risks. However, I know that my solution could prove effective because it provides many of the required pieces of the Pennsylvania Learning Standard. This is a way to include the required learning and computer science at the same time.

1. Layered Development Schedule: Break your project down into the layers and give a schedule for when you expect to complete each layer. Remember to include which team member will be responsible for each part.

Planning in Layers:

You can't accurately anticipate how long each step in your project is going to take. Consequently, you need to make a detailed development schedule that is layered. I suggest using this structure to describe your layered development schedule:

1. Functional minimum: minimal items you will implement to make a computing for social good prototype. You may not be incredibly proud if you only got this far, but at least it'd be something that you could show and tell about. Be specific about what is “interface only” versus “implemented with backend support”, and what tools you will use for implementation vs. mock-up.(This is probably D+ to mid C work)

This part could be completed in a few days. This is pretty much just an outline of what the program is about. This also includes a small example of what the students could potentially learn. A mini lesson. Perhaps a guide to how the teacher would implement the data science into the everyday lesson plans. Also, how the students would be measured on this concept.

1. Your low target: Your target for what you want to get done--the least possible to feel pretty OK about the result. (This is likely solid B or higher C level work)

All of part a and basic operating prototype of the program. I want to have this done by the end of this week.

1. Your desirable target: This is what you're aiming for, if things go reasonably well. (This is likely B+ or A- level work)

A full prototype working and complete. I plan to have this finished by March 29, 2022.

1. Your high target: It might be possible to get this much done, if all goes extremely well (This is A to A+ level work)

A full prototype. I tested on at least three students. Feedback of a caregiver, educator, or tutor. This should be by the date of the presentation.

1. Your extras: Stuff that you know you can't get done this semester, but you might add later if you decide your project is cool enough to keep working on after the class is over, just for fun. This is not counted toward the grade, but we want to see your grand vision.

Structure your development so that you complete each layer before going on to the next. Plan exactly what is entailed in each layer and identify which team member is going to do each component.

Advice: Do One Thing Well

Your computing for social good project needs to really stand out in one way (but NOT all ways). Doing one aspect of it well will get you a better grade than doing a mediocre job on a lot of things. Identify where you want to focus. To decide, you probably want to weigh factors like what you’re already good at and can build upon, what may be impressive that you learn in a short period and show growth, and a “wow” factor.

1. Description of Your Solution: Describe the solution in detail: approximately one to two pages text plus three pages of mocked-up screenshots and/or sketches. Photos of pencil sketches or whiteboard sketches are fine. I'm not looking for beautiful art; you’re attempting to storyboard and capture how your solution would work.

As an implementation of this program, I will make a computerized lesson that will teach kindergarten students how to analyze data. The data analyzation will move through five steps.

1. Identify the data that is to be analyzed
2. Collect the data
3. Clean the data
4. Analyze
5. Interpret the results

The program will incorporate many of the lessons that are described in the in the Pennsylvania Learning Standard for Early Education for Kindergarten. There would many different versions of this program by grade level but this protype will focus on kindergarten students. The protype version of this program will include sections 1.1 Foundational Skill, 2.1 Numbers and Operations, 2.2 Algebraic Concepts, 2.4 Measurement, Data and Probability, and 15.4 Computer and Information Technology. The program will be an interactive story time style that will be appealing to the grade level of the students. The student will ultimately have to organize a set of objects, the teacher could choose to the options of having the student organize objects by color and shape. The number of comparable sets are set to increase as the student completes the lesson ranging from 2-10. Each set will contain a different number of objects ranging from 2-20.

1. Identify the data that is to be analyzed / Defining questions or goals

The goal could be something as novice: Put all the like colors or shapes together. Can you help all the shapes find their home or family?

1. Collect the data / data to be used

For simplicity there would be objects of likeness ranging for 2-20. The student must group like objects in a particular place.

1. Clean the data / removing outliers

For simplicity there would be object(s) that our outliers, for instance an object that is maybe the same color but a different shape or an object that is a different color but the same shape. Typical this will also be of quantity 1 because the real data set will have to be two or more up to 20.

1. Analyze

Students will analyze the data. There will be a series of questions ask to the students about the data sets i.e what color is the object in the sets? How many objects are in each set? Which set has more? What shape is each set? Etc.

1. Interpretation of results / creating data visualizations

The data will be display in many different charts for the student to see.

When student completes a level, they will move up a level.

A picture containing text, whiteboard

Description automatically generatedA piece of paper with writing on it

Description automatically generated

1. Evaluation Criteria: What criteria should be used to judge if your design is a success or not? Tell us what the main strength of your computing social good solution will be. What part is going to be important for addressing the problem? Who might want to use this solution? Who would benefit from the solution? Basically, you are setting up a worldview for your subsequent design. Additionally, you should tell us what is the most challenging area of growth of knowledge/practice for you, and how you will demonstrate that you’ve gained in knowledge and skills with respect to some computing concept.

I think my design should be judged on how thought out all of this is. The main strength would ultimately be the creating something that could potentially exposed public-school students to Computer Science education more seamlessly. Educators, tutors and or parents might find this program good to use. I think that researching and finding the way to implement this into the curriculums proved challenging. I still must collect data. I think me building the prototype would prove that I have gain knowledge and skill in some computing regard as I have never done anything like this before.