

Teaching Assistant: Speech-Recognition, LCD-Display for Advanced Low Cost Learning

Senior Design 1

Initial Project Identification Document

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Group A

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Customers, Sponsors and Significant Contributors:

**Motivation**

Education is the most important gift that can be provided to a person. At its most basic level, it provides someone with the baseline skills that are necessary to thrive as an adult in our ever changing society. Education has the ability to inspire, induce confidence, and make the world a better place. We feel, however, that public education can sometimes get left behind when it comes to innovation and an effort to improve. One of the major reasons behind this, as we can all assume, is government budgets and public funding. Education can be very expensive while schools and government agencies never seem to have as much funding as they need. This is the motivation for our project. One of the major initiatives for improving young education across the United States is the inclusion of iPads, tablets, and laptops into the classroom. While we believe that these devices can provide immense benefit to students, these devices can be very expensive. We sought out to design a device that students could use in conjunction with their teacher that could provide similar uses to those high cost devices but at a much better value. We believe that at a lower cost, educators, parents, and institutions would be more willing to accept technology into their classrooms.

**Goals, Objectives, and Function**

The goals for our teaching tool would be to create a low cost device that students could use to interact with and engage in challenging tasks to further their involvement in the classroom. This device would include a microphone and use speech recognition to take input from the user. This solves two issues. This allows for students at any age to be able to use the system while also limiting the amount of inputs to the system in order to keep the price low. The device would also include a small display so that users could read questions and tasks from the device. A large enough power supply would have to be included so that this device could be portable and used for a suitable amount of time. Lastly, this device would include memory and USB connectivity to store results and transmit those results to a teacher in class. I strong example for this device would be young students trying to learn the alphabet or their multiplication tables. A teacher could give an assignment to the students where they are to study multiplication when they get home. The student would take out the device and the device would ask for the answer to simple math problems. The student would then say the answer into the device and the device would either accept the answer or tell the student that they were wrong and try again. The device would store the statistics for how well they are doing on this assignment and when the student comes in to class the next day, could transmit this data to the teacher. The student could also use the device as much as they liked and use it as a fun study tool. The teacher could then see how well the class is doing and how much they studied and practiced. We believe this device would be useful to both students and teachers and increase involvement inside and outside of the classroom, while also providing a valuable education tool and a fraction of the cost of other technologically immersive devices.

**Engineering Requirements/Specifications**

The teaching assistant will be used to help kids learn their numbers, the alphabet, languages, math, etc. by using speech recognition. With this tool the teachers would be able to monitor and analyze the data received from this device and shall be able to adjust their teaching style to address the trouble areas monitor by this device.

1. Speech recognition software

The teaching assistant device will be capable of Speech recognition software to detect the response of the user. With the speech recognition software being capable to collect the users’ response allows the device to analyze the data collect and check if the spoken answer was correct or incorrect. Being able to detect the if the correct answer was spoken or not will decided whether the program can move on to the next step.

1. User interface

For the teaching assistant a user interface will be designed so the users can have the appropriate interaction with the device. The user interface will not be too advance so that kids would be able to use it with ease.

1. LCD screen

A LCD screen will be used for the teaching assistant device. LCD screens have a wide range of brightness, which will produce bright images. This is very suitable to environments that are brightly lit, like class rooms, so the kids using it will be able to see the images clearer due to the anti-glare technology. The LCD screen is also light weight which will help with the portability aspect of this device. Also LCDs produce low electricity, so this will not drain the battery of the device.

1. Battery

For the teaching assistant it will be using a 5V rechargeable battery, and this conclusion was due to researching of other kid edition tablet devices.

1. Microphone

A microphone will be incorporated in the teaching assistant for the speech recognition aspect of this device. The microphone will be low cost which is great for the cost of production, and would be uncomplicated to install into the device.

**House of Quality**



**Block Diagram (Hardware/Software)**

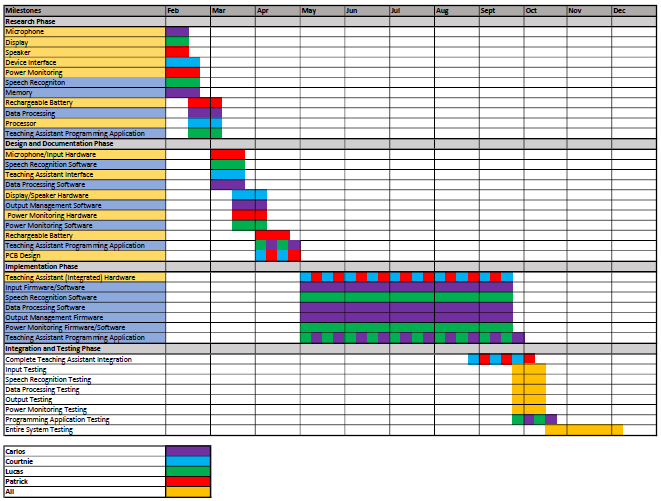


**Budget**

**Financing Plan**

While everyone on the team has agreed to share any financial burden created by the project equally, we will seek sponsorships and other means to finance this project. Upon selecting a project, and receiving approval we will submit proposals to companies interested in investing in fire alarms and those looking to showcase their semiconductor and component products. A tentative list includes: Texas Instruments, Taiwan Semiconductor Manufacturing, Local Public School District (OCPS, SCPS, etc.), Kramer Electronics and UCF, in addition to possibly attending EdTech Orlando Conference in February to network with possible sponsors. If no sponsorship or financial help is achieved, the team is responsible for any costs incurred.

**Project Timeline**

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**Decision Matrix**