Project Identity

Freely Adjustable and Accessible Keyboard and Arrow Pad for Client with Cerebral Palsy

Work Completed

Throughout the winter intersession, I kept in close contact with the client’s contact and his team at Hampton Elementary. His new wheelchair does not allow him to get within close enough proximity of the desk to use a mounted keyboard properly. This forces us to readjust our design of the keyboard stand to match the needs of the client with his new wheelchair. The client’s team also requested that the keyboard stand will be able to move in three different ways: outward, vertically and able to tilt.

I had a meeting with Bill to discuss what the best option would be to readjust our design to meet these new specifications. He suggested that we use 80/20 products to manufacture the new stand. Listed below are the pros and cons of using 80/20 material that he specified.

Pros: Easily assembled, strong and durable, adjustable
Cons: Expensive, long waiting time to receive material

After weighing the pros and cons, and discussing it with Nolan, it was decided that 80/20 would be our best option. Below is an image of 80/20 material used in construction of a table.

Figure 1. 80/20 Material
I created a preliminary design of the new stand that will replace the old one. It will connect to the desk using clamps and will extend out to the client, so he has easy access to it. I am currently in contact with Miriam (client contact), and am going to meet with her and the client’s team on Wednesday to discuss the new design and if they think any modifications should be made.

Also, over winter intersession I took the University of Connecticut School of Engineering Machine Shop class and completed it successfully. I gained valuable experience working on lathes, mills and other miscellaneous tools in the machine shop. Our project will require much use of the machine shop to construct the stand and the keyboard itself, so it was imperative that I was certified over break to use the machine shop.

Over winter intersession Bill ordered the parts from our parts list, and all the materials came in. We received our LEDs, Cherry MX switches, keycaps, the control board and PVC. The first thing we decided to do was to test the LEDs and get acquainted once again with using a protoboard. We simply connected the LEDs to a 2.4 voltage source that was in series with a Cherry MX switch. When the switch was compressed, the LED lit up. To confirm that all the voltage was passing through, a multimeter was used and the 2.4 volts was confirmed. Below is an image of the LED lighting up.

Figure 2. LED lighting up when switch is compressed.
Future Work

A major setback to the work being done on our project occurred because the CD-Rom drive is broken on our computer. To connect the keyboard control board to the CPU, the software must be installed on the computer. No programming can take place until the control board is connected. We got in contact with Bill, and he said the CD-Rom drive should be replaced by Tuesday (1/30/07). Once this is done, we can start working on programming the control board.

The design of the internal circuitry should be finalized within the next week or two, and the internal components of the keyboard can start to be put into place.

On Wednesday (1/31/07), Nolan and I will meet with Miriam and the client’s team to finalize the design of the new stand. Once this is accomplished, we will contact 80/20 Inc. to start the ordering process.

Project Review

The redesign of the keyboard stand and the CD-Rom drive not working have delayed the group somewhat. By the end of this week we should be caught up by contacting 80/20 and installing the control board software on the CPU. The internal layout of the electrical components should start to take shape within the next week and two, as was indicated on our timeline.

Hours Worked:

7