

Explore – Impact of Computing Innovations

Written Response Submission Template

Please see [Assessment Overview and Performance Task Directions for Student](#) for the task directions and recommended word counts.

Computational Artifact

2a)

The electric wheelchair is a computing innovation that helps people with mobile disabilities move around easily through using a joystick on an electric wheelchair to move the wheels. The computational artifact, which was made with Canva.com, shows these through the pictures and backgrounds of the infographic. For the background pictures, they are captioned with text explaining the theme of the background, which are either how the wheelchair functions, or how it helps people. At the bottom are pictures showing equality for people who use wheelchairs, and a schematic of an electric wheelchair.

2b)

To create my computational artifact, I used the online tool, canva.com. I first logged into Canva and selected to create an infographic using the soybeans template. I then downloaded pictures from the internet and ones sponsored by canva, and uploaded them to software. I dragged the pictures to where I wanted them, and scaled them create a background or an accompanying picture. I finally inserted text boxes by clicking the textbox tool, and selecting the correct textbox to describe the pictures. Citations were added in afterwards using a different text style, which was modified through selecting a new textbox.

Computing Innovation

2c)

The electric is used by the mobility disabled to move around through moving a joystick on the electric wheelchair, which sends an electrical signal to the computer. The signal is turned into bytes for the motor to convert into the amount of electricity to use to turn the wheels. A beneficial effect of this is that people with electric wheelchairs don't need help from others to participate in activities, so they are given more social freedom[12]. Since they are more independent due to them being able to move around with less help, the option of doing activities with others on their own becomes available, allowing more time to hang out with people[3]. This can apply for many situations allow for a drastic amount of social freedom compared to a regular wheelchair. This can also turn into something harmful, as the electric wheelchair doesn't remove the fact that a person has a mobility disability[3]. Multiple studies have shown that people with electric wheelchairs get a greater lack of sympathy from people compared to people who can walk[3]. This is due to the fact that people are less likely to interact with people who are disabled unless they have to, and an electric wheelchair simply doesn't remove that disability barrier.

2d)

The user of an electric wheelchair uses a joystick, which can move forward, backwards, left, right, and anywhere in between [1]. Depending on the joystick placement, it will hit a trigger that creates an electrical signal for the computer to correspond to the placement [2]. The computer transforms the signal to bytes for direction and rotations per minute, and sends electricity to the motors [2]. Depending on the necessary rotations per minute of the wheelchair, both wheels will receive different amounts of electricity, which is consumed by the motor turn it, and rotate the wheels [1]. While this set-up works well, a data security problem with it is that anyone can access the computer. This creates a data privacy concern, as there is no built in security system for most electric wheelchairs, which means that after someone turns the wheelchair on, anyone can use the wheelchair, change the data on the wheelchair and much more. In

other words, the computer is unable to recognize if any unauthorized people are using the electric wheelchair, allowing for people to steal any electric wheelchair. This also means that people who have access to the on-board computer are able to see and change personalized settings for the wheelchair [11]. Some people customize their wheelchair, as hospitals use some to take care of patients. This means that if an intruder got into an electric wheelchair's settings, they could severely hurt someone by changing the settings of a wheelchair, changing how everything operates with the wheelchair.

References

2e)

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