



Developing Wheelchair Attachments to Improve Independence.

By: Sidney Krandall, Laura Murphy, Miranda Veaser, and Matthew Sanfield

Abstract & Objectives

One's life quality is often dependent on the ability to be independent. The ADAPT team found that the independence of those who use assistive devices was often limited by the lack of quality and variety of the products they use. Our team is working to design a series of solutions to improve independence and overall life quality for those who use assistive technology everyday. In this endeavor we start by developing a series of attachments for those who use wheelchairs. One of the most important components to the development of these products is to maintain a close working relationship with the end user. This work features two of these people, Mary Pittman and her mother, Glenda. We chose these particular individuals as they represent two important populations: end users, and caretakers. We continue to work to improve independence of both these populations.



Current & Future Solutions

To address Glenda's struggle to access the objects she uses everyday, our team began making more advanced prototypes of a base attachment which Glenda could attach her belongings. The images shown to the right show the most recent prototype, along with a cup holder attachment. We write directly on these prototypes so that we can more easily make changes to the next iteration. It is important moving forward that we make these devices as compact as possible, so as to not interfere with Glenda's ability to get in and out of the chair as that is her mode of transportation. Strengthening weak points in the design will be our first step moving forward. ADAPT will then continue to develop a series of solutions to help Glenda and other wheelchair users navigate everyday life in a safe and efficient way.



The Problem

Along with her water bottle, Glenda Pittman also stores her sunglasses, breathing device, and cell phone (illustrated above) on her wheelchair seat. Not only is this solution uncomfortable, but her things often fall through the seat back onto the floor. Glenda and her daughter are both concerned that, at 99, she can be at risk of injury from falling out of her chair attempting to pick up her belongings when home alone.

The Bigger Picture

As we continue to develop products and infrastructure, it will become increasingly important to keep disability in mind. The Baby Boomer population reaches seniority ensuring safety and independence will be important for maintaining high quality lives, and for keeping health-care costs down. Designing more empathetic products can reduce the need for paid assistance and prevent the need for health care relating to injury.

Assistance from the Library

With the library resources, we were able to 3D print several of our prototypes in addition to receiving valuable information regarding patent law/resources. Moving forward we will continue to use the 3D Lab, while continuing to search the patent databases for possible conflicts. These resources will be essential to implementing social change. Having enough room for our designer and engineer to work at the same time helps us remain efficient in our work.

This project is sponsored by a 2015-2016 mini-grant awarded through the University Library's Student Engagement Program. As part of the mini-grant, I was paired with Paul Grochowski, Engineering Librarian.