

Grant's Variable Height Chair

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Background

Every year, the University of Tennessee at Chattanooga partners with special needs organizations in the Chattanooga area. Signal Centers Inc. provides several projects and opportunities for the UTC Engineering Design students each semester. The Variable Height Chair was designed for an individual by the name of Grant Nunley. Grant is a special needs student at Signal Centers Inc.

Purpose

The Variable Height Chair was designed to provide Grant mobility around the homestead at different locations and in reference to height and position. The chair's sole purpose was to safely contain Grant while still allowing him to interact during play time, dinner, and social events.

Design/Method

The team talked to Grant's parents to have a better understanding of the individual needs of Grant as well as the parents' preferences. The specific need of the chair was to change heights between household surfaces such as countertops, dinner tables, and coffee tables. The chair needed to be easily transportable, in case the parents wanted to commute with the chair outside of the home. The chair was designed to safely contain Grant in and around the homestead daily. The chair needed to fit into ADA compliant doorways to allow ease of accessibility. The team created several design options by brainstorming and rough sketches to determine different ways to lift the chair. The team then evaluated the design's compliancy to the client's needs through the use of morphological charts. This process provided the methodology in selecting the chair's final design.

Results

The final design of the Variable Height Chair met all the needs and wants specified by the client. Grant's chair easily changes heights with an adult's assistance. Gas shocks were implemented into the design to assist in raising the height of the chair. The chair's surface height accessibility ranges from 22 to 42 inches. Rollers were used on the chair's base to allow mobility in the home. The chair's dimensions allow full accessibility to ADA compliant doorways. The chair can easily fit into a trunk of a standard size car after breakdown.

Conclusions

Overall, the chair met all the needs of the client. The client was contacted approximately nine months after the completed chair delivery to follow-up concerning any design flaws, safety concerns, or suggestions. The client was highly satisfied with the overall design and product and suggested that there were no issues concerning the variable height chair.