Indoor Accessibility for the Visually Impaired: Talking Toilet as a Assistive Technology Product

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Abstract:

Aim: The aim of this research is to develop a motion-sensör equipped useful assertive technology product that enhances indoor accessibility for visually impaired individuals by providing audio descriptions of the features of toilets.

Materials and Methods: This study is a single-group pre-test- post-test methodological research. The developed prototype is an embedded system based on ESP32, tirggered by a wall-mounted PIR motion sensor, and trasferring voice guidance recordings from a MicroSD card to a speaker via an MP3 module. The study sample consisted of visually impaired adult individuals (n:32) living in İzmir who agreed to participate in the research, without sample selection. The Sociodemographic Questionare and The Indoor Accesibility Assessment Scale for Toilet were used as data colletion tools. Data were collected by the researchers through face-to-face interviews. The data were analyzed using SPSS 29, and a paired sample t test was used to compare pre-test and post-test mean scores.

Results: 56.3% of the participants were male, with mean age of 34.12±16.36 (min 17 age , max 68 age). 81.3% (90% and above) and 18.7 % (70-90%) of the participants were visually impaired. 50% of the paticipants were university graduates and 43.8% were high school graduates. The Cronbach Alpha value fort The Indoor Accesibility Assessment Scale for Toilet. was found to be .79 for this study. There was a statistically significant difference between the pre-test and post-test mean scores of the scale (t: 16.212; p<0 .01)

Conclusion: The developed Voice-Guided Accessible Toilet assistant as a useful assistive technology product, with its PIR-based contactless triggering, audibly announces the location of indoor equipment, reducing the need for unnecessary contact and effectively improving indoor toilet accessibility for visually impaired individuals.

Keywords:

Accessibility, accessible toilets, assistive technology product, indoor accessibility, visually impaired, utility model.