

Tech-Enabled Homes: Integrating Mainstream and Assistive Technology

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Objective: To explore the perspectives of people with physical disabilities on using home-based electronic assistive technologies for home control and automation



Electronic Assistive Technology in the Home (EAT-H)

“Devices and systems that help people with disability manage daily tasks at home by aiding with controlling the home environment or automating household appliances and their functions. These technologies include hardware and software such as smart home technology, virtual assistants, smart speakers, and specialised ECS. Along with other mainstream devices such as smartphones and tablets, these technologies can be integrated with apps or software, with interaction between the user and the technology involving a variety of interfaces ranging from physical switches to eye gaze or voice control”. (Yaffe et al., 2025, pg 2)¹

Background

People with physical disabilities can use electronic technology to assist them in daily lives. This technology is evolving and offers a growing range of opportunities. There is evidence that using dedicated environmental control system (ECS) results in improvements in quality of life, relationships, autonomy and feelings of safety^{2,3}. Likewise the use of mainstream technology such as voice assistants (Alexa, Google Home)⁴ and smart home technology (SHT) also offers benefits⁵. However there is also evidence of technical challenges⁵. This leads to the paradox of experience of “Empowerment and Frustration”² and “Engagement and Hassle”³. Understanding the perspectives of successful EAT-H users can inform future use.

Methodology

Methodology: Qualitative descriptive study underpinned by appreciative inquiry.

Ethics: Informed consent provided by participants and ethical approval from the University of the Sunshine Coast.

Participants: n= 9 participants who have spinal cord injuries, cerebral palsy, spondylarthritis, or brain injuries. All used combinations of specialised assistive technology, including environmental control systems, speech recognition software as well as mainstream smart devices such as: voice assistants, smart speakers, lighting, locks, thermostats, and video doorbells.

Data collection: Modified World Café method in small group discussions over four rounds; discussions were hybrid with participants attending the café virtually or in person.

Data analysis: All recordings were transcribed verbatim. Semantic themes were developed using an iterative inductive thematic analysis approach⁶.



Published paper available

Yaffe, J. C., Ripat, J., Dermody, G., & Verdonck, M. C. (2025). "Assistive technology in the home is choice and control... it's freedom": perspectives of people with physical disability using electronic assistive technologies in the home. *Disability and Rehabilitation: Assistive technology*, 1-15.
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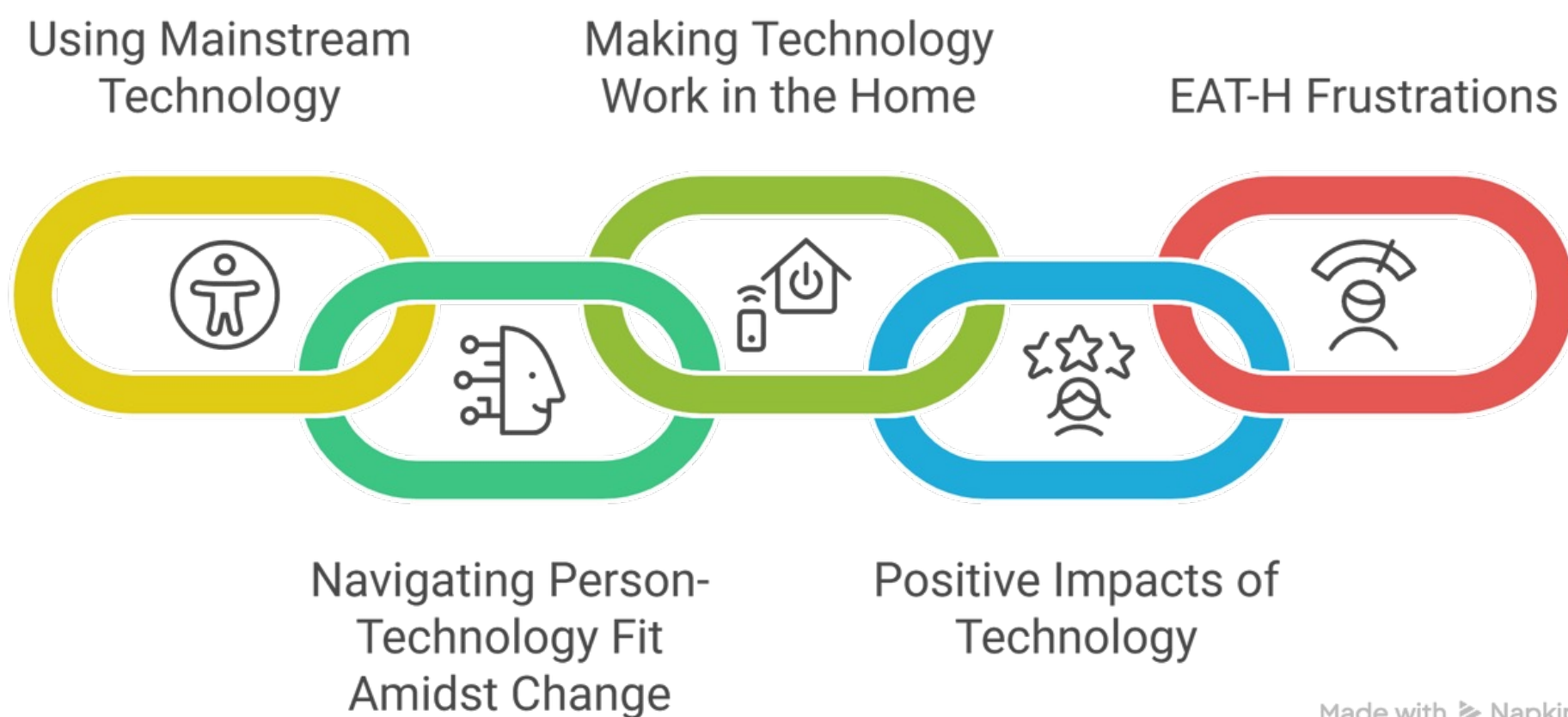


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Findings – themes

Data was analysed by a team of four in several stages using Reflexive inductive thematic analysis⁶. Five themes were identified, each with subthemes: 1) The value of using mainstream technology, 2) Navigating a person-technology fit amidst change, 3) Ensuring reliable technology in the home, 4) Impact on independence choice and control, and 5) Technology challenges and frustrations.



Made with Napkin



Using Mainstream Technology

Participants valued the availability of mainstream technology as assistive technology:

- Mainstream technology was reported to be both more affordable and widely available.
- They described how they had adapted everyday smart products (such as smartphones, tablets, and smart speakers) to meet their functional needs and abilities.
- They provided examples of their personalised combinations, including mainstream and specialised devices.

"the availability ... in mainstream stuff has improved a lot, ... for the... keyless entry. I just went down to a highway shop and brought that ... so I think availability of getting them, is easier to get now, and find."

Navigating Person-Technology Fit



Using EAT-H involved exploring multiple options to seek technology that fits the person:

- Using EAT-H is an ongoing, evolving journey.
- People's needs change over time.
- They are constantly considering new technologies as they become available.
- Each person needs to find the right combination of devices that work for their specific situation.

"Mine's more like a Frankenstein system where I've just adapted each time some new technology's come along, we've just thrown a new piece in the works"



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Findings – themes (continued)



Making Tech work

Participants described the things they needed to ensure their EAT-H worked:

- Reliable technology with backup systems is essential
- Power outages/internet failures have serious life-altering consequences for EAT-H users
- EAT-H users need ongoing support from family, technical experts, and health professionals
- Peer support communities were particularly valuable

“Control4 system (mainstream home automation) within my home ... it’s got its own little set of brains ... so, if there is a power outage or an internet outage ... safety net ... I can get out of my home”

Positive impacts

Participants described several positive impacts of using EAT-H, including:

- Daily tasks were easier,
- Reduced need to ask others for help,
- Provided independence,
- ↑Ability to spend time alone without constant care,
- Normal relationships,
- Enabled connection with distant family and friends,
- ↑Mental health, ↑Self-worth, ↑Sense of control,
- Enhanced safety and security.

“[EAT-H] reduces my kind of cognitive load... you’ve got to ask and possibly explain how”

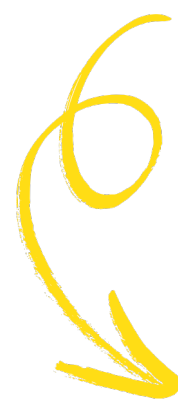


Frustrations

There were also descriptions of several frustrations:

- Unreliable technology, which doesn’t work consistently, especially voice control
- Funding challenges - especially for mainstream devices
- Untrustworthy suppliers and installers
- Privacy concerns with voice-controlled devices

“they [installers] talk the talk, but they can’t deliver.”



**Easy read
version
published
here**

Key Findings and Significance

This study highlighted the dynamic nature of developing technology and the opportunities and challenges regarding integration with existing technology. Occupational therapists have a role in embracing new technology in the home to ensure this matches each person’s needs and abilities, fits within each unique context, and promotes occupational participation.

Occupational therapists must understand each person’s unique EAT-H experience to help navigate reliability concerns, funding barriers, and supplier selection.

References

- 1 Yaffe, J. C., Ripat, J., Dermody, G., & Verdonck, M. C. (2025). "Assistive technology in the home is choice and control... it's freedom": perspectives of people with physical disability using electronic assistive technologies in the home. *Disability and Rehabilitation: Assistive Technology*, 1-15. <https://doi.org/10.1080/17483107.2025.2542378>
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