SMART Devices – Environmental Control System Case Study

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Overview

- Electronic Assistive Technology (EAT) - Environmental Control System (ECS)
- Background to Mick
- EAT Assessment
- Mick’s ECS Journey
- Trial of ECS with own SMART Device
- Outcomes & Recommendations
- Implications for Service Delivery
Electronic Assistive Technology (EAT) can be thought of as any electronic device that supports someone's independence and sense of well-being, which can fall into two main categories:

1. Mainstream technology
2. Specialist devices designed specifically for those with a disability

Environmental control systems (ECS) offer people with severe physical impairments some autonomy in controlling electronic devices in their own environment (Verdonck et al 2011).

The rapid development of Smart Devices has resulted in the possibility of using Smart Devices as ECS.

This means that ECS are now more accessible to all occupational therapists rather than isolated to assistive technology experts.
Background

- 23 years old.
- Irish university student, recent geography and economics graduate.
- Lived with his parents and adult younger sister.
- Interested in Irish sport (hurling and Gaelic football), soccer and swimming.
- Spinal cord injury C4 ASIA A, motor vehicle accident.
- Some C5 activity bilaterally with his right stronger than his left.
- Bilateral elbow flexion contractures.
- Mick could use both arms to gesture.
- Required bilateral wrist extension splints and customised seating to use his arms functionally.
Mick sustained a C4 ASIA A spinal cord injury, admitted to acute hospital.

Transferred to rehabilitation hospital in a single room in the acute care unit.

‘ClickToPhone’ App installed on Mick’s Smartphone for telephone control.

HouseMate switch adapter programmed as ECS in acute care unit.

Moved to rehabilitation ward Smartphone ECS used in new ward no adjustment required.
Mick upgraded Smartphone - larger screen

Discharge preparation - Private purchase of mounts, switches & HouseMate+

Successful customisation & use of ‘ClickToPhone’ & HouseMate on ward and in OT department

Family educated to programme House-Mate using ClickToPhone app to work with home appliances

Mick discharged to family home
Mick used a large screen Sony Xperia Smartphone

The **ClickToPhone app** was downloaded to the Smartphone

**ClickToPhone app** settings customised
‘Clicktophone’ App

- Scanning app with access to:
  Telephone, Contacts, Texts, Photos, Music, other apps, & HouseMate ECS
Housemate Switch Adapter

- Stand alone switch adapter
- Physical access: input socket for ability switch
- Communicates with phone via Bluetooth
- Transmits infra-red and Z-wave for environmental control of household appliances.
- Required programming—learning IR signals from target devices
Switch

- A device for making and breaking the connection in an electric circuit.
- Buddy Button.
Mounting

- Smartphone & Switch positioned using combination of RAM and Manfrotto mounts.

- **Smartphone**
  - In bed: mounted to bed side rail
  - In wheelchair: mounted to wheelchair frame

- **Switch**
  - In bed: buddy button ability switch attached to a mounting plate attached to a Manfrotto variable friction arm which was clamped to the bedrail.
  - In wheelchair: buddy button was attached to the wheelchair arm rest and activated using his right splinted hand.
Mick could control the television and radio (infrared) using the Smartphone ECS.
Implications for service

- ECS have moved into the digital era and their integration with mainstream smart devices make them more accessible to all occupational therapists.

- Successful ECS use in this case was aided by the use of the client’s own device and the early inclusion of ECS.

- Smart devices facilitate the incorporation of ECS into physical rehabilitation, thereby enhancing autonomy for service users with significant physical disabilities.

- This case study demonstrates how early introduction of ECS and the use of service users own technology supports successful utilisation and can limit abandonment.
Useful Information

Reference:

Equipment sources:
- HouseMate, ClickToPhone, switch: Unique Perspectives LTD http://www.click2go.ie/
- Manfrotto LTD : http://www.manfrotto.com/
Thank You for Listening.

Any Questions?