

# Novel Navigation of an Alternative and Augmentative Communication Device

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## 1. Overview

This single case report summarises an innovative solution used to overcome the access challenges faced by a person with both physical and sensory impairments to use an AAC device. The authors infer issues to be considered more generally for communication aid provision for people in this population.

## 2. Background

Throughout England there are a number of nationally recognised specialist teams (that work with other professionals in local teams across a region) to provide electronic assistive technology to people with physical disabilities. When considering access to technology the mix of impairments a person has, directs and influences the potential solutions. Although a purely physical impairment can have significant challenges, when that is combined with a sensory impairment, these challenges can increase.

The client used for this case report was an 8 year old child (Sidney). Sidney was referred with a physical impairment and severe visual impairment to the Barnsley AT Team (a specialised AAC service). However, he was cognitively able and his motor skills for direct access to a communication aid were good. Unlike a switch user who would potentially be able to use auditory support as part of the scanning process (i.e. listen to the options and press to select), this child required a communication interface that allowed him to physically and independently navigate around the screen of his chosen language system.

## 3. Methods

This is a single case report gathered as part of normal clinical practice within a specialised AAC service. Within this case report, observational assessment was used to identify and monitor Sidney's progress in accessing the language package on his device over a period of months.

### 3.1 Ethical statement

Ethical approval was unnecessary because it is an anonymised single case report. Appropriate client permission was obtained. Sidney is not the real name of the referred child.

## 4. Results

Sidney was five when he was referred to the Barnsley Assistive Technology Service. He had a good understanding of language but no adequate means of expressing himself. It was felt that a high tech communication aid could provide Sidney with the means he needed to express himself.

Sidney was initially set up with a touchscreen device which had two rows and four columns of motivating vocabulary with a key guide. The key guide allowed Sidney to navigate along the rows and columns and know where one cell ended and the next started.

Sidney quickly demonstrated that he could remember where words were stored. The layout was, therefore increased to four rows and four columns and Sidney demonstrated he was able to navigate from the home page to a subject page and then back to the home page. These skills suggested that it was an appropriate time to introduce Sidney to a formal language package and so 45 location WordPower™ [1] was installed on his device.

Although Sidney was managing to communicate with the device, access needed to be improved to:

1. Allow Sidney to access more vocabulary items easily on his device
2. To decrease the number of mishits, therefore increasing efficiency and effectiveness of communication

A trawl of commercially available key guides was carried out to try and identify a product that provided multi-sensory information that would give Sidney his current location on the vocabulary grid and facilitate navigation from one area to another. However, none was available.

Discussions within a multi-disciplinary meeting allowed ideas to be generated and the technicians within the team put forward potential design ideas for custom made key guides to achieve these requirements.

A Laser cutter was used to produce a key guide. The key guide (see Figure 1) was layered with the top layer splitting the page

into eight sections and the bottom layer splitting each of the eight sections into six shapes. The aim of this format was to provide the child with a specific sensory reference for each cell of the vocabulary package.

The key guide has now been provided and 1:1 support is being given to enable Sidney to learn the layout and understand the sensory references that are now available. A period of monitoring and review will allow observation if there has been an increase in efficiency in Sidney navigating the vocabulary set. This will be measured by recording a number of vocabulary items Sidney uses spontaneously and independently and the number of two word combinations he uses.

### 5. Discussion

This case report demonstrates the specific considerations required when investigating an appropriate communication aid for an individual with both sensory and communication difficulties. The authors propose should be considered for such clients:

1. Future proofing of systems so that they develop with the child as their language needs and literacy develop. In this case, the shapes could be replaced by Moon or Braille textures and allow Sidney to use the skills he has learnt throughout his education.
2. Balancing access and language needs: In this case, a decision between the number of icons manageable per single screen and the number of layered screens needed. By allowing Sidney the maximum number of icons on his home screen we have reduced the number of

layers, and therefore the memory load required.

3. The consideration of motor planning to develop automaticity and therefore spontaneity and ease of use of the aid. In this case, motor planning was Sidney's strength as he could not rely on visual guidance and he had shown he could retain motor plans. The keyboard is designed to reinforce the learning of the motor plans

### 6. Conclusion

Now that access is theoretically addressed, any further barriers to Sidney navigating the system, using the vocabulary within the layout and becoming a more effective communicator should be more easily identified and hopefully resolved.

The requirement to have specialist services with access to the equipment and facilities to provide such bespoke solutions is essential to meet the complex needs of clients with combined sensory and physical impairments.

This case report highlights the need for and benefits of a multi-disciplinary team to address these specific needs. Those working directly with clients can identify the unmet need, and the MDT forum then allows for discussion, sharing of knowledge and problem solving in providing an innovative solution.

### 7. References

1. WordPower – Inman Innovations, inc.

### Keywords:

3D key guide, AAC, Visual Impairment, VOCA, Tactile support, alternative, augmentative, communication

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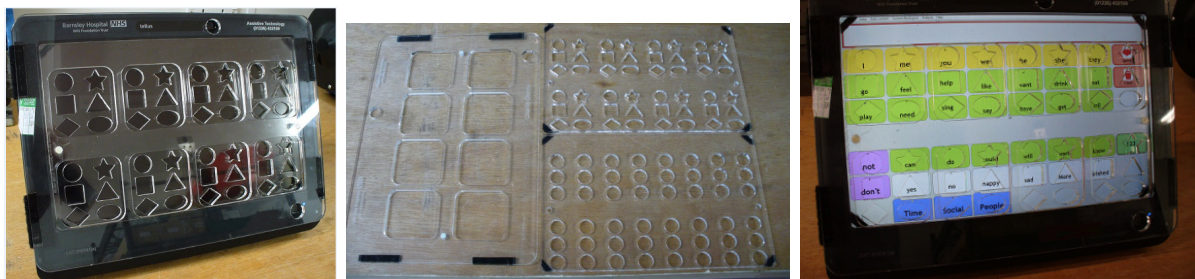


Figure 1 : The developed multi-layer keyguard