

Augmented and Alternative Communications

Ohio University AAC Lab Sponsored Project

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1. Introduction

1.1 Background

The client of this proposal is the manager of the Augmentative & Alternative Communication (AAC) Laboratory at the University of Ohio. Dr. John McCarthy, the one overseeing the lab, has spent years working with individuals who use augmentative and alternative communication. Dr. McCarthy works extensively with children who suffer from communication impairments and utilize AAC in their daily lives.

In the United States alone there are several million people who suffer from communication impairments so severe that they are not able to adequately communicate with others. Many of these individuals make good use of AAC, which ranges from a voice output aid to a computer device used to type documents. Communication disorders encompass a wide variety of problems in language, speech, and hearing. Speech and language impairments include articulation problems, voice disorders, fluency problems, aphasia, and delays in speech and/or language. A child with speech or language delays may present a variety of characteristics including the inability to follow directions, slow and incomprehensible speech, and pronounced difficulties in syntax and articulation. Issues arise with many who use AAC because most also suffer from physical disabilities that cripple their ability to interact with the devices. The individuals generally have one effective movement that they are capable of making, using that to interact with an external device to communicate.

1.2 Purpose of the Project

The purpose of this project is to improve existing methods of augmentative and alternative communication (AAC) that use scanning. In scanning, items in a selection set are presented sequentially and the user makes a selection through some type of communication aid. Unfortunately children typically have trouble learning to use the current methods of scanning and could greatly benefit from an easier method. For this reason reducing the learning demands of AAC technology is a primary goal. Another issue in scanning is the tradeoff between speed and ease of use. Namely, if the scanning is too fast it is difficult to use and repetitively selecting the wrong object can be very frustrating, especially to a child. Conversely, if the scanning is too slow it can take a long time to convey a simple message. For a child with physical disabilities who may require instant attention for issues such as becoming sick or needing to use the restroom this is unacceptable. This project will maximize the relationship between speed and ease of use. By improving the ease of use of AAC a beneficial side effect should be a change in the attitudes and behaviors of others towards those who rely on AAC.

1.3 Previous Work Done by Others

Of particular interest are children who have a difficult time learning to interact with a device that works off of one specific movement to operate. It has been seen that children understand and adapt to an interface that places items into context with imagery.

A process known as scanning has been used where a cursor moves in a specific order, highlighting an item at each step that can be selected. As an example, an image of a bedroom could be used and various objects around the room would be highlighted in a specific order. To use this method a child must have a basic knowledge of a cursor and how it operates. Suggestions (Light and Lindsay 1991) have been made to make an animated character that a child could relate to that would move around the environment presented and picking up items along the way. The idea is that a scene with an animated character will aid the child in learning through visual recognition. Examples of products that utilize the scanning system include those made by Zygo Industries, which specializes in tablet devices running an advanced operating system and high-resolution interface. Overall, most products have focused on having buttons with preset functionality with little room to expand. Visual interaction of an environment has not been a primary focus of companies in the design of products. Also, the needs to reduce the learning demands of an AAC device have not been met for children. Current devices call for a certain level of understanding of the world around an individual, which a young child of four years old would not have.

1.3.1 Products

- **ADVOCATE**, Zygo Industries Inc, Advocate is a direct selection and scanning communicator designed for use by individuals with communication or speech disabilities. Price \$1490.00
- **BULLETIN BOARD COMMUNICATOR (MODEL 8800)**, Enabling Devices, The Bulletin Board Communicator, model 8800, is a scanning communicator with a nurse call feature designed for use by individuals with motor and communication disabilities. Price \$139.95
- **DIALECT**, Zygo Industries, Dialect is a direct selection and scanning communicator designed for use by individuals with communication disabilities. Price unavailable
- **DYNAMYTE 3100**, Dynavox Systems LLC, The DynaMyte 3100 is a voice output communication board designed for use as an augmentative communication aid by individuals with cerebral palsy, head injury, post stroke, and other neurological disabilities affecting the ability to speak. Price \$6395.00
- **E-TALK TABLET WITH CRADLE**, The Great Talking Box Company, E-Talk Tablet with Cradle is a direct selection communicator designed for use by individuals with communication or speech disabilities. Price 4995.00
- **FIREMAN LADDER CLIMBER (MODELS 140 & 140-8)**, C H I, The Fireman Ladder Climber is a switch operated toy that can be used as a scanning communicator for individuals with physical, cognitive, sensory or speech disabilities. Price \$32.95
- **LIGHTWRITER SL87**, Zygo Industries Inc, Lightwriter SL87 is a scanning and keyboard communicator designed for use by individuals with communication or speech disabilities. Price \$6995.00

- OPTIMIST III, Zygo Industries Inc, Optimist 3 is a portable direct selection or scanning communicator designed for use by individuals with communication or speech disabilities. Price 5695.00
- PATHFINDER PLUS, Pentke Romich Company, The Pathfinder Plus is a portable electronic direct selection or scanning communicator designed for use by individuals with speech and language disabilities. Price \$8345.00 to \$7995.00
- TANGO! Blink Twice, Tango! Is a direct selection or scanning communicator designed for use by children with speech or communication disabilities. Price \$6899.00

1.3.2 Patent Search Results

Patent# 6128010 – A general purpose computer functions as an augmented assisted computing (AAC) system. The AAC system facilitates user access to, and control of, general purpose Computer programs. In particular, the computing device is universally accessible to all users, regardless of physical ability.

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