Abstract

The advent of tablet-based augmentative/alternative communication systems affords speech-language pathologists and their non-verbal clients’ new opportunities in the clinical setting. This descriptive case study explores how two clinicians introduced one such system to six children with disabilities, and follows the children’s progress toward greater communication. Case study methodology and qualitative data collection of field notes, frequency counts and interviews allowed for deep exploration of the phenomenon in its natural environment. Four themes emerged from our data analysis: 1) practical issues exist with the hardware and software, 2) the speech-language pathologist serves as expert guide/facilitator, 3) end-user motivation and engagement are high, and 4) positive communication outcomes are attainable. Strategies for therapeutic implementation stemming from these findings are reported.

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1. Introduction

Augmentative and alternative communication (AAC) continues to advance technologically to meet the needs of individuals with speech and language impairments. Dedicated speech-generating devices of the 1980s required users to type what they wanted to say word by word, a task impossible for most non-verbal children. AAC has since evolved to include much more efficient symbol-based systems making it easier for the user to produce quick responses because of the implementation of pictures and icons (Chapple, 2011). Apple’s iPod and iPad technologies have further revolutionized the AAC landscape in terms of accessibility, ease of use and affordability.

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High quality, full-featured applications like Assistiveware’s Proloquo2Go, Sono Flex by Tobii Technology and Legend’s OneVoice are mainstay software to insure optimal tablet-based communication. Although there is a paucity of research on the effectiveness and best practises of iPod/iPad-driven AAC, Proloquo2Go (P2Go) is currently the most studied application, as it has been on the market for several years. The application, which runs on the iPad, iPodTouch and iPhone, is category-based and offers over 14,000 symbols to build a vocabulary that meets the needs of the user. Other innovative features include research-backed vocabulary organization, natural-sounding children’s voices, advanced word-prediction, and extensive customization options. P2Go can provide visual supports using photographs as well as symbols, and the app can be programmed on-the-fly, as new vocabulary is encountered. The individual can communicate with P2Go via discreet words or through full sentence construction, making this application very versatile and accessible to a wide range of users.

The convergence of full-featured, symbol-based AAC apps like P2Go, loaded on the iPad, in particular, has afforded children with multiple disabilities unprecedented means to communicate. The iPad, as compared to the iPod and iPhone platforms, is large enough that individuals with gross and/or fine motor impairment can access the device. The customization options of P2Go allow the speech/language pathologist (SLP) to introduce the device with only one or two symbols on the screen, an ideal presentation for a child with cognitive impairment to begin to learn cause and effect and simple communication. A small body of research exists that supports P2Go usage, at least on the iPod, with children and youth with autism and developmental disabilities. Kagohara, van der Meer, Achmadi and colleagues (2010) successfully used a behavioural intervention to enable an adolescent with autism to learn the basics of P2Go on an iPod. Advanced usage of P2Go on the iPod was achieved by two students with autism in an extension of this study, using prompting, prompt-fading and differential reinforcement (Achmadi, Kagohara, van der Meer, et al., 2012). In a similar study, van der Meer, Kagohara, Achmadi and colleagues (2011) used graduated guidance, time delay and differential reinforcement to teach iPod and P2Go usage to two individuals with developmental disabilities. These investigations, although informative, address very specific behavioural interventions for teaching students with disabilities how to use iPod-based speech AAC, and do not attempt to capture or describe the phenomenon of iOS/P2Go training in its entirety. We were interested in exploring the overall dynamic between SLP and clients (in this case, children and youth with multiple disabilities) as the iPad and P2Go were introduced, taught and reinforced. We sought to identify and understand current and best practises using iPad and P2Go in the clinical setting, especially when introducing these technologies to children with cognitive and physical impairments. We wondered, can these children improve their communicative abilities by using iPads and P2Go? How might this happen and how quickly?

Ultimately, the purpose of this descriptive case study was to observe SLPs as they introduced non-verbal children with multiple disabilities to the iPad and P2Go in the clinical setting, and to identify effective practise and potential obstacles surrounding this new AAC. We chose case study methodology because we were intent on understanding how an SLP might go about teaching children with disabilities the necessary skills to use the iPad and P2Go to communicate. We were curious as to where to begin, how to progress, and what barriers to learning may occur in using iPads in the clinical setting. According to Hancock and Algozzine (2006), ‘through case studies, researchers hope to gain in-depth understanding of situations and meanings for those involved’ (p.11). This was precisely what we wanted to do—understand the interactions and dynamics between a child with multiple disabilities and his or her SLP as together they began using an iPad-driven AAC system.

2. Method

Two speech-language pathologists at a mid-western university’s children’s hospital recruited six participants for this study. All participants met the following criteria: (a) school aged individuals between the ages of 4 and 18, (b) limited expressive language abilities precluding communication of daily wants and needs and self-expression (as determined by a certified speech language pathologist), (c) little to no exposure to the iPad and Proloquo2Go, (d) sufficient motor skills to operate the AAC communication system, (e) necessary poverty level to meet the financial criteria for iPad donation from a Hospital-related volunteer organization. Because our research was designed to explore the phenomenon of iPad/P2Go introduction in the clinical setting, we considered the two SLPs as co-participants. Both were females, with 4-6 years of experience as clinicians. The SLPs were new to working with iPads, but had some experience working with P2Go on other iOS devices. Both had several years’ experience introducing other means of AAC (low tech and dedicated speech generating devices) to children with multiple disabilities.
Two Hospital SLPs agreed to participate in the study, and they in turn recruited six participants from their caseloads using the selection criteria listed above. The SLPs had previously evaluated each participant’s receptive and expressive language and had determined that these six individuals were strong candidates for iPad and P2Go usage. The six participants’ disabilities varied, and included autism, cerebral palsy, cognitive impairment, repaired cleft palate and seizure disorder. We observed the individual therapy sessions of each participant for six weeks. Sessions lasted 45 minutes to 1 hour and took place in small therapy rooms at the Hospital. During each session, we took detailed field notes (running narratives plus margin notes and questions) documenting the behaviours of both the SLP and the participant. We also made frequency counts of observable SLP behaviours such as verbal and physical prompting. Following the six-week observation period, we conducted semi-structured interviews with parents and the speech-language pathologists.

Using Marshall and Rossman’s (2006) protocol, we began analysis by organizing our observational data into notebooks and immersing ourselves in the running narratives via multiple readings. Next, we generated categories of data and outlined associated themes. We then coded all notes by themes, and resolved disagreements about codes through discussion and re-visititation. Marshall and Rossman suggest two additional steps in the analytical process that we found most useful: offering interpretations through analytic memos and then searching for alternative understandings. To accomplish these tasks, we reviewed our margin notes and frequency counts to flesh out the analytic memos with more detail. Rich discussion enabled us to explore possible alternative understandings of our themes.

To address issues of trustworthiness, we utilized the mechanisms of prolonged time, triangulation and member-checking (Creswell, 2003). Spending prolonged time in the field allows the researcher to ‘develop an in-depth understanding of the phenomenon’ (Creswell, p.196) that lends detail and credibility to the narrative report. Our repeated observations of each child over a six-week period allowed us to begin to know the SLPs and participants well and to see patterns of behaviours during the therapy sessions. Triangulation was achieved through the collection and analysis of multiple sources of data, including running narratives of observations, margin notes, frequency counts and interviews. Member-checking was accomplished via 1) informal follow-up conversations with the SLPs following each therapy sessions, and 2) targeted questions in the semi-structured interviews.

3. Results

Four common themes emerged from our analytical efforts: 1) Practical issues exist with the hardware and software, 2) the SLP serves as expert guide/facilitator, 3) user motivation and engagement are high, and 4) positive communication outcomes are attainable.

3.1 Practical issues

Each child-participant encountered practical, physical issues when learning to use the iPad and P2Go. All six participants, regardless of gross and fine motor abilities, had some initial difficulty with the physical actions required to operate the iPad’s touch screen, especially in knowing how much pressure to apply to the screen when swiping or selecting an item. Without exception, however, each participant learned over the course of one or two therapy sessions how to do these actions correctly. The SLPs used modelling along with a combination of verbal and hand-over-hand prompts to teach the children how to manually operate the tablet.

Participants encountered several issues interacting with P2Go. The ‘back’ icon was small and difficult to activate for those with less than optimal fine motor control. The app requires a double tap action to clear what has just been said, and some participants found this concept and movement difficult to understand and execute. It was also too easy for users to inadvertently exit out of the application. For this study, we were using the first generation P2Go app; fortunately, Assistive ware has responded to criticisms and has addressed these weaknesses in P2Go 2.0. Another practical issue that arose was a factor of the multi-functionality of the iPad itself. Once the participants learned that there were other apps to explore, they all wanted to spend less time in P2Go and more time on applications like Netflix and iPhoto. Apple has since responded to this issue via iOS 6, which has a locking option to keep users in a specific app.

3.2 SLP as expert guide/facilitator

A second emerging theme focused on the skill sets of the SLPs as they taught participants how to use the iPad and P2Go. Both SLPs slipped back and forth quite seamlessly from expert guide to facilitator roles; the former
directly characterized by physical prompts and hand over hand assistance, the latter evidenced by verbal prompts and conversation. Each participant needed both types of instruction, albeit some needed more hand over hand work than others. Both SLPs introduced the system to the children by personalizing the ‘all about me’ section of P2Go’s vocabulary, entering the names of each child, their family members, favourite possessions, and so on. This proved highly motivating for participants, who enjoyed hearing their names and other personal information spoken aloud, and the exercise also served to draw parents into the mix, as they had to provide the SLP with personalized vocabulary.

After allowing the children to explore and use the ‘all about me’ vocabulary, SLPs taught the functions of certain actions and icons, namely how to scroll, and the home, back and clear icons. This instruction was carried out through modelling and then repeated reminders and practise, ‘Can you go back one page?’, ‘Can you clear the words?’ All participants were able learn these basic controls, some immediately, others over several therapy sessions. A more nuanced level of instruction then ensued, where the SLPs taught when to use the home button (i.e., when lost or confused in navigation) and how often to use the clear button (frequently, as the spoken word area gets cluttered). Participants were able to execute these actions when prompted, but only two (Jared and Christine) would learn to do these things of their own volition.

SLPs varied in their approaches to family involvement. One preferred to meet with the parents/guardians after each session, giving feedback and a bit of iPad/P2Go instruction one on one. The other SLP invited parents to sit in on the therapy sessions. This was helpful for training purposes as the parent learned alongside the child. Sometimes, however, the child was distracted by the parent’s presence, and behaviour issues ensued.

Once participants had mastered P2Go’s basic controls and were able to answer simple questions about themselves, the SLPs began to add more vocabulary topics and choices. Sometimes, this was done through play-based therapy sessions, a method that proved highly engaging for the children, especially the two 4-year-olds. In these sessions, the interaction was first focused on a toy of some sort that the SLP brought to the table. In order to play with the toy, the SLP required the child to use the iPad in addition to her voice.

We saw each SLP’s iPad and P2Go skills grow over the six-week therapy sessions. The SLPs further customized vocabulary by programming the device on the spot. This level of spontaneity was appreciated by the children who showed increased engagement as new pictures and words came into play. As the SLPs came to know each family, they were better able to use family-specific programming; for instance, having the device say ‘Papa’ instead of ‘Daddy’ if that was the preferred name for Father. As the SLPs became more proficient in P2Go, further customizations offered children greater communicative ease. Frequently used vocabulary was given a prominent place, and the voices and rates of speech could be adjusted to suit a child’s preference. Some participants benefitted from the addition of a ‘what I want to say is not here’ button on each page; this was accomplished by the SLP via simple programming.

In later therapy sessions, we began to see the SLPs do less teaching on how to use the device. It was evident over the course of the therapy sessions that control of the iPad was transferred from SLP to participant. The SLPs’ expertise was essential initially to help the child start off with a positive experience, especially since P2Go, with its depth of features and vocabulary, can be overwhelming. Targeted instruction, modelling and turn-taking were strategies the SLPs used to help participants gain confidence and competence with the device. By the end of the six-week therapy period, each child was able to use the iPad independently. The SLPs migrated their efforts to facilitation of meaningful communication and to help the parents and guardians learn to program the device.

3.3 High motivation and engagement

For all six participants, the iPad and P2Go captured interest quickly and sustained engagement over most therapy sessions. Our field notes are riddled with comments and observations concerning children’s attention and affect. In almost every session, participants would smile upon seeing the iPad, and reach eagerly for it. All six expressed a strong desire to explore the vocabulary of P2Go, pressing icons, hearing the words spoken and even smiling or laughing when they stumbled on a familiar or personalized phrase. Further evidence of how compelling the iPad is was observed when some children showed preference for the iPad over the toys the SLP brought out. We repeatedly saw emotional responses to the iPad AAC sessions. Children would flash huge smiles when they were able to scroll and find what they wanted to talk about. If the iPad wasn’t in sight when the session began, children would look for it, and those who had some speech asked for it directly. They enjoyed showing it to parents and siblings, and several attempted to teach their parents how to use the device.
3.4 Communication is increased and enhanced

Our field data documented many instances of participants’ increased and enhanced communication when using the iPad and P2Go. Post-observation interviews with SLPs and parents corroborated our findings. Field notes indicated that for several children, as time and exposure to the iPad increased, so did the children’s spontaneous usage of the device. We also noted that participants began to self-correct as they gained experience, in other words, if they made a mistake in what they tried to say on the iPad, they made efforts to go back and say the phrase or sentence correctly. Frequency count analysis showed a decrease in SLP prompts over the course of therapy, indicating children’s improvement in using the iPad to communicate. In follow up interviews, parents spoke emotionally about the increased and enhanced communication their children displayed post study. Several parents felt their child’s verbal speech also improved and the confidence to try to communicate, whether verbally or using the iPad, had increased.

4. Conclusions

Results indicate that children and youth with significant disabilities can, fairly quickly, learn to use P2Go on an iOS device, and that use of this system permits non-verbal children greater opportunities to communicate. Even though our participants were quick to learn how to use the iPads and P2Go, our findings indicate the SLP plays a pivotal role in process by serving as expert guide and facilitator. SLP familiarity with both hardware and software results in clients’ speedy skill acquisition and reduced anxiety. Additional research into the effectiveness of discreet methods for teaching hardware and software usage is warranted.

References


