Degree Project in the Field of Technology and the Main Field of Study Computer Science and Engineering
Second cycle, 30 credits

A Qualitative Investigation of Speech Language Pathologists on The Acceptance of High-Tech AAC Among Their Patients Using Extended Technology Acceptance Model

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Master’s Programme, Interactive Media Technology, 120 credits
Date: October 10, 2023

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Swedish title: En kvalitativ undersökning av talspråkpatologer om accepterande av högteknisk aac bland deras patienter som använder utökad teknologisk accepteringsmodel
A Qualitative Investigation of Speech Language Pathologists on The Acceptance of High-Tech AAC Among Their Patients Using Extended Technology Acceptance Model

MARIA MAJID

ABSTRACT

Due to the advancement in AAC technology, set of medical conditions can be assisted using high-tech AAC, serving more patients with varying communication needs. There need to be more studies about the acceptance of HT-AAC among individuals with complex communication needs, by understanding their attitude and behavioral intentions towards this technology. This thesis aims to extend previous literature and address the gap by exploring the perceptions of SLPs' regarding the acceptance of high-tech AAC and the perceived pitfalls associated with using HT-AAC. An exploratory research method combined with qualitative approach was chosen to answer the research questions and serve the purpose of the study. SLPs recognize the importance of HT-AAC in various aspects of their patients' lives. The findings highlight the need for comprehensive support, specialized training, and addressing implementation challenges to maximize HT-AAC acceptance and usage. By addressing these aspects, HT-AAC can enhance the communication and overall quality of life for patients with communication difficulties.

1 INTRODUCTION

1.1 Understanding of AAC and Its Purpose:

Augmentative and Alternative Communication (AAC) systems are designed for people with complex communication needs (CCN). These are the devices, techniques, and tools that can act as a replacement for natural speech so those with speech disorders can become genuine and autonomous communicators. AAC systems have changed the lives of many individuals with various speech disabilities. These individuals’ speech is compromised for various reasons, including developmental disabilities, or acquired disorders. While some patients can partly rely on natural language, others can't and thus need AAC systems to support their communication needs. People of all ages can benefit from these systems. Due to increased awareness and acceptance of AAC in recent years, the implementation of AAC among all age groups has been made possible [9]. The advancements in mobile technology have opened opportunities for the development of countless high-tech AAC systems, a few of them including dedicated computers, speech-generating devices (SGD), and tablets [1].

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Document date: October10, 2023

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1.2 Types of AAC Systems: The kind of AAC systems recommended for patients with CCN depends on their condition, communication needs, and motor abilities. The recommendation process is better known as AAC intervention. It is a specialized approach to help these patients express themselves effectively by introducing them to the necessary tools. AAC intervention is provided by a team of professionals, including occupational therapists, physical therapists, assistive technology specialists, and educators. However, the SLPs are usually the critical providers of AAC intervention as they have specialized knowledge in assessing, implementing, and managing AAC systems. A variety of AAC systems are available, including aided and un-aided AAC.

a) Un-aided AAC does not involve external tools but relies on bodily actions like eye blinking, sign language, gestures, and vocalizations [2].
b) Contrary to that, Aided AAC is supplemented with tools like communication boards with symbols (pictures, objects, printed words, etc.) or high-tech options, including computers, tablets, and speech-generating devices.

1.3 Advancements in High-Tech AAC (HT-AAC):

The use of HT-AAC has enhanced the lives of many speech-impaired individuals. According to a study [3] on 50 Amyotrophic Lateral Sclerosis (ALS) patients, 96% accepted the device, with some adopting it immediately and others after some delay. The reasons for adoption were maintenance of communication, employment, and community participation. Unfortunately, patients depend highly on external support to benefit from this technology [4].

1.4 The Role of Speech-Language Pathologists (SLPs):

Speech-language pathologists (SLPs) are the primary players in treating these patients. They are trained professionals with expertise in communication disorders and assistive technology. SLPs work closely with the patients, their families, and the other team members to develop a customized plan that addresses the individual's communication needs and goals. The SLPs are also responsible for ongoing assessment, troubleshooting, and support to ensure that the AAC system is adequate and appropriate for the individual's changing needs. This brings them to the front line of contact with their patients. Investigating SLPs' perspective of the attitude and potential behavior intention of their patients will offer a possible understanding of the adoption of HT-AAC.

Their perceptions provide valuable insights into the effectiveness and usability of HT-AAC for individuals with communication challenges. SLPs are central in introducing and implementing AAC systems for their patients.

1.4.1 SLPS as Experts in Assistive Technology:

Understanding their perspectives will help identify potential barriers and challenges during adoption of HT-AAC. Since they also work closely with caregivers, educators, and healthcare specialists, their views on the support system are insightful for the field. Furthermore, their feedback on the performance of the technology can inform manufacturers and developers, leading to improvements in AAC technology to address patient needs and preferences. Findings from studying SLP perceptions can be valuable in advocating for resources at the policy level, ultimately benefiting patients' access to these technologies [5].

1.4.2 SLPS' Perspective on HT-AAC:

Despite the many benefits of HT-AAC, there are several barriers to accepting this technology. A few of the most highlighted barriers to acceptance include HT-AAC literacy, support, funding, and provision of the technology. [4-6]. This study will investigate the SLPs to understand the current level of acceptance of HT-AAC among their patients using the extended Technology Acceptance Model (TAM). It also aims to explore the perception of SLPs regarding the barriers and pitfalls associated with HT-AAC.

1.4.3 Technology Acceptance Model (TAM) In Studying HT-ACC Acceptance:

The technology acceptance model is a theoretical model proposed by Davis [6]; the model presents a compelling framework for understanding the users' attitudes toward a particular technology. According to the model, perceived usefulness and ease of use affect the users' attitudes toward the use of technology. Subsequently, this attitude impacts the user's behavioral intention to accept or reject the technology. [6] Although perceived usefulness and ease of use are crucial to technology acceptance, other determinant
factors outside this model may affect the acceptance. TAM has been used to study the approval of many different technologies. A study exploring the acceptance of health informatics found a positive impact on perceived usefulness and ease of use by system quality, service quality, and system efficiency [7]. In another study, the acceptance of Metaverse was investigated using extended TAM to find multiple effects: self-efficacy, perceived curiosity, and perceived pleasure positively affected perceived ease of use. In contrast, social norms, perceived joy, and perceived ease of use positively impacted perceived usefulness. Ultimately, perceived effectiveness and ease of use positively impacted the user’s attitude towards Metaverse [8]. Based on that, the technology acceptance model can help explore patients' attitudes and behavioral intentions to accept HT-AAC. The ever-growing technology in the field of AAC creates a need for studying the behavioral choices of the users of this technology.

1.5 Objectives:

Research has been carried out to understand the abandonment of AAC; the existing literature lacks SLPs' perspectives on the acceptance of HT-AAC among individuals with complex communication needs and the perceived barriers that affect their attitude towards adopting it. This study aims to understand the behavioral intentions of the patients using Extended TAM Model by identifying the factors that affect those. It will provide insights to the clinical professionals on the implementation of HT-AAC and the manufacturers of AAC to realize and overcome the existing barriers to acceptance of this technology. The study will also contribute to the academic literature on AAC.

More specifically, this research will be guided by the following questions:

**Research Question 1:** What are the perceptions of SLPs regarding the acceptance of high-tech AAC among their patients?

**Research Question 2:** What are the perceptions of SLPs regarding the usefulness of HT-AAC? What makes high-tech AAC the preferred assistive communication tool over other low/no-tech AAC methods today?

**Research Question 3:** What are the current perceptions of SLPs about the usability and learnability of the HT-AAC?

**Research Question 4:** Based on the SLPs’ experiences, what are the perceived pitfalls associated with using HT-AAC that cause frustration among their patients?

1.6 Comprehensive Synopsis of Thesis:

1st Chapter provides the reader with a glimpse of research and a first impression of the study of Augmentative and Alternative Communication (AAC) systems, the role of Speech-Language Pathologists (SLPs), and the Technology Acceptance Model (TAM) in Studying HT-ACC Acceptance. 2nd Chapter will document research data through semi-structured interviews. 3rd Chapter will discuss Assessing Technology Acceptance in HT-AAC. The TAM Framework, the impact of Perceived Usefulness and Perceived Ease of Use on Patient’s Attitude and behavioral intentions. 4th Chapter will share data collected after the interview. In 5th Chapter, there will be an analysis of the data from interviews and the development of a relationship with 2nd Chapter. In the 6th Chapter, conclusion insights will be drawn from the Endings to answer research questions, which were proposed in Chapter No. 1.

2. METHODOLOGY

2.1 Ethical Considerations:

- **Conflict of Interest Disclosure:** It is important to address potential ethical concerns in the context of this study. While the research was conducted during an internship at Tobii Dynavox, it is crucial to clarify that the study was not financially supported by the company and was carried out as part of the degree requirements. The role of the affiliation with Tobii Dynavox in the study's design, data collection, and interpretation of results will be transparently discussed in the following sections, emphasizing the commitment to ethical research practices and the pursuit of unbiased and credible findings. Moreover, Ethical approval was acquired from Tobii Dynavox to carry out this study within the company.

- **Formulation of Study:** This study was conceived and developed during my employment with Tobii Dynavox, as part of a company project aimed at understanding the needs SLPs. The study's inception was a direct response to the broader company initiative to enhance our understanding of the field's requirements. Acknowledging the company's specific context and
The SLP has recommended HT-AAC to multiple patients. The potential for bias was mitigated by seeking feedback from diverse colleagues, ensuring that a wide range of perspectives were considered. These interactions and feedback loops are addressed transparently in this study to maintain ethical research practices and to provide a complete picture of the research process.

- **Participant Autonomy**: It was ensured that the participants remain autonomous to express their opinions and were not influenced or restricted in their responses due to my employment with Tobii Dynavox.

- **Informed Consent**: Written consent was obtained from the participants for their involvement in the study. Data confidentiality and anonymity was ensured throughout the study.

### 2.2 Research Purpose: An Exploratory Journey

This research aims to fill the gap in the literature by identifying the behavioral intentions of patients in acceptance of HT-AAC from the SLPs, as they are the industry experts and deeply involved in the entire process of AAC implementation. The outcomes of this research would be resourceful for HT-AAC manufacturers to overcome the barriers to adoption of this technology. Moreover, it will guide the SLPs to make informed decisions by knowing the obstacles and facilitators related to HT-AAC.

### 2.3 Research Approach

A descriptive qualitative approach was taken to investigate the perspectives of SLPs regarding the acceptance of HT-AAC among their patients. It is a research approach that aims to describe a phenomenon or topic of interest comprehensively. It focuses on capturing participants' perspectives, experiences, and behaviors in a rich and detailed manner [28]. This makes it an optimal choice to achieve the goal of this study.

To collect the data, open-ended interviews were carried out with SLPs in United States and Canada to allow them to share their thoughts and perspectives in their own words. The scope of this study was narrowed down to understand the perception of North American Speech Language Pathologists due to access and convenience for collecting data as a student using existing networks that facilitated contact with North American SLPs. Furthermore, there has been widespread use of AAC tools and technologies in the region i.e., over 2 million adult and child users [6]. This prevalence suggests that the region has a robust landscape and rich data for studying the adoption, challenges, and facilitators of HT-AAC. It is important to note that the findings from this study may not be generalized for other regions due to cultural and policy differences.

### 2.4 Research Strategy: Employing In-Depth, Semi-Structured Interviews

The expert sampling strategy was mainly used to recruit participants. They were purposefully selected based on two criteria:

**a)** The SLP is highly skilled at HT-AAC.

**b)** The SLP has recommended HT-AAC to multiple patients.

The interview strategy helps to provide a thorough understanding of the research processes being carried out. Questions that are being used in exploratory research help in generating answers for strategic interviews. A total of ten SLPs were interviewed, of which seven were selected through the company’s database, and the rest were selected via snowball sampling. All the participants had several years of experience with patients having complex communication needs in different clinical settings and ages.
They fulfilled the above-mentioned required criteria. The SLPs were from diverse backgrounds and ethnicities, bringing rich experiences. The selection included seven females and three males. The strategy used for sampling fulfills the goal of descriptive qualitative analysis as it resulted in an understanding of the phenomenon from individual HT-AAC experts [28].

Table 1: Group Participant Information

<table>
<thead>
<tr>
<th>Title</th>
<th>Experience</th>
<th>Education</th>
<th>Specialization</th>
<th>Country</th>
<th>Gender</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLP1</td>
<td>8 Years</td>
<td>Bachelors</td>
<td>Pediatric</td>
<td>Canada</td>
<td>F</td>
<td>36</td>
</tr>
<tr>
<td>SLP2</td>
<td>10 Years</td>
<td>Bachelors</td>
<td>Pediatric+ Adult</td>
<td>U.S.</td>
<td>F</td>
<td>40</td>
</tr>
<tr>
<td>SLP3</td>
<td>5 Years</td>
<td>Masters</td>
<td>Pediatric+ Adult</td>
<td>Canada</td>
<td>F</td>
<td>35</td>
</tr>
<tr>
<td>SLP4</td>
<td>15 Years</td>
<td>Bachelors</td>
<td>Pediatric+ Adult</td>
<td>Canada</td>
<td>M</td>
<td>45</td>
</tr>
<tr>
<td>SLP5</td>
<td>3 Years</td>
<td>Masters</td>
<td>Pediatric</td>
<td>U.S.</td>
<td>F</td>
<td>34</td>
</tr>
<tr>
<td>SLP6</td>
<td>8 Years</td>
<td>Masters</td>
<td>Adult</td>
<td>U.S.</td>
<td>F</td>
<td>37</td>
</tr>
<tr>
<td>SLP7</td>
<td>12 Years</td>
<td>Masters</td>
<td>Pediatric+ Adult</td>
<td>U.S.</td>
<td>M</td>
<td>44</td>
</tr>
<tr>
<td>SLP8</td>
<td>6 Years</td>
<td>Bachelors</td>
<td>Pediatric+ Adult</td>
<td>U.S.</td>
<td>M</td>
<td>33</td>
</tr>
<tr>
<td>SLP9</td>
<td>11 Years</td>
<td>Masters</td>
<td>Pediatric</td>
<td>Canada</td>
<td>F</td>
<td>41</td>
</tr>
<tr>
<td>SLP10</td>
<td>5 Years</td>
<td>Masters</td>
<td>Pediatric+ Adult</td>
<td>Canada</td>
<td>F</td>
<td>36</td>
</tr>
</tbody>
</table>

2.5 Optimizing Sample Parameters:

The data collection used an interview guide, which was created after a thorough review of the literature. The interview guide had 15 questions in total, out of which 9 of the questions were open-ended, and the others required Yes/No answers. To ensure the effectiveness of the interview guide, a preliminary interview was carried out with an HT-AAC skilled SLP within the company. The SLP made small recommendations specific to questions related to support. The interview guide was divided into four sections (perceived usefulness, perceived ease of use, attitude & intention, and resources) with underlying questions related to the corresponding section. A pre-interview questionnaire was shared with the participants to collect their demographic data.

2.6 Effective Interview and Data Collection Process:

Data was collected by carrying out individual semi-structured interviews. The rationale behind choosing this method for data collection was to get in-depth insights from the personal experiences of the participants [28]. Before the interview, the participants filled out the consent form highlighting information about the current study and terms for data collection. Due to time and physical availability, the interviews were conducted virtually using Teams and Zoom meetings. It is important to note that the interviews were recorded and transcribed verbatim after seeking consent for the purpose of analysis.

2.7 Thematic Analysis: A Qualitative Approach:

Once the data was collected, it was consciously examined using thematic analysis. Thematic analysis is a qualitative technique to interpret various patterns/themes in texts, visuals, or audio. This method is highly utilized within healthcare, psychology, and anthropology [29-30]. Using this analysis technique, transcripts from the first two interviews were analyzed by thorough reading to find meaningful words/phrases. This resulted in the initial codes. The next step was to look for recurring ideas and patterns that could be found in the regulations. These codes with common ideas formed the initial themes. The
remaining transcripts were then examined for similar codes and themes until the themes were refined and clarified. Ultimately, the analysis phase involved two key steps:

a) Identifying and selecting pertinent data excerpts that effectively demonstrated and exemplified each theme

b) Establishing connections between the present findings and the existing body of literature.

3. LITERATURE REVIEW:

3.1 Assessing Technology Acceptance of HT-AAC: The TAM Framework:

The Technology Acceptance Model (TAM) is widely used to investigate a specific technology's acceptance [7-8]. The original model had two variables, i.e., perceived usefulness and ease of use, which were considered to impact the users' attitudes towards the technology and ultimately affect the behavioral intention to adopt the technology.

3.1.1 Perceived Usefulness:

Perceived usefulness is a concept that refers to the extent to which users believe that a particular technology will improve the outcomes of their work [6]. In the context of HT-AAC, the technology is helpful if the SLPs report improved accuracy and efficiency in their patients' communication using well-programmed vocabulary and phrasing; in that case, the behavioral intention of the patients towards using the technology will be stronger.

3.1.2 Perceived Ease of Use:

Perceived ease of use refers to an individual's perception of the effort required to effectively utilize a particular technology to improve work performance. This perception is based on the individual's belief that the technology is user-friendly and can be used without significant difficulty or inconvenience [6]. Meanwhile, if the patients are reported to find HT-AAC easy to use, they will be inclined to use the technology in the long term.

3.1.3 Impact of Perceived Usefulness and Perceived Ease of Use on Patients’ Attitude:

Studies have shown a significant impact of perceived usefulness and ease of use on the behavioral intention of the users to use the technology [7-8,17]. In the assistive communication setting, perceived usefulness and ease of use positively impact the patients' preferences to accept HT-AAC [4-10-14]. Attitude towards the technology refers to the acceptance or rejection of the technology [6]. To understand this in the HT-AAC context, a study revealed that the positive attitude of the patients and their communication partners towards AAC contributes to long-term success [18].

3.1.4 Impact on Patients’ Behavioral Intentions:

Behavioral intention is the willingness of the user to perform a specific behavior [6]. In terms of HT-AAC, the behavioral definition refers to their desire or intention to use high-tech AAC devices for communication purposes, not as toys or therapy tools [18]. Moreover, a positive relationship exists between the perceived ease of use and perceived usefulness, increasing the behavioral intention to use [6-8]. This pattern is also seen in the context of HT-AAC; if the device is easy to use, the patients will continue to reap the benefits of the technology and are less likely to abandon it [19].

3.1.5 Extensions of TAM with External Variable R:

Various authors have extended TAM to understand different technologies better. The extension considers other external factors that may affect the use of technology, which depends on the disciplines and the technology used. For instance, it was argued by the authors of one of the TAM Extensions that the barriers related to resources (R), including lack of time, money, and support, can become a hurdle in adopting technology and, hence, it became part of the Extended Technology Acceptance model [20].

Research echoes the importance of resources (R) as a critical determinant in adopting information systems. [21,22]. As a result, this study will use TAM with external variable R, which in the case of HT-AAC involves support, training, time, and funding [13-18]. These variables will help investigate SLPs for
their patients’ attitudes toward HT-AAC, that also influences the behavioral intention to accept or reject the technology.

3.2 Perceived Usefulness of HT-AAC:

Several studies highlight the positive impact of HT-AAC on patients with complex communication needs. It is essential to know that the acceptance of AAC technology is much higher in some medical conditions than in others. According to studies, patients with ALS and Traumatic Brain Injury are reported to be satisfied with using AAC technology and plan to continue using it long-term [3-10]. The patients found the HT-AAC helpful as it helped them form a broader range of communication functions than those who used low-tech AAC. Since HT-AAC provides a higher number of output options, it facilitates communication. The authors exemplify this by referencing the digital/synthesized speech output function available to the patients for conversing over a phone call [4-10-13].

- A survey involving seven college students who use HT-AAC emphasized its usefulness. These students reported success in their academic communication through features like pre-programmed vocabulary, written and email communication [11-12]. Despite challenges, HT-AAC has enabled numerous patients to attend college and university programs.
- A study performed on caregivers of ALS patients to understand the purposes of their HT-AAC uses found that although the communication was slow for face-to-face conversations, it was still among the most widely used function of HT-AAC, reflecting the usefulness of the technology [3]. This finding underscores the practical utility and importance of HT-AAC technology, especially in the context of individuals with ALS.
- The adequate use of HT-AAC was reported to enable the patient to communicate, improving their quality of life and well-being. This implies that individuals who rely on HT-AAC experience a notable improvement in their ability to interact and engage with others, resulting in a higher quality of life. Moreover, it was concluded that HT-AAC enables the maintenance of social roles and intellectual stimulation [13]. Which indicates that HT-AAC contributes to enabling individuals to participate in social activities and engage in intellectual pursuits, which are essential for a well-rounded and fulfilling life.

3.3 Perceived Ease of Use:

A study on adoption of HT-AAC in education settings revealed that technology acceptance could be lower due to factors revolving around the lack of HT-AAC skills among educators and SLPs to provide ongoing support for children with CCN. It was found that technology requires training for practitioners
and patients as it is challenging to use. It was also discussed that the HT-AAC, like any other technology, occasionally requires ongoing acquisition of new knowledge that can’t be learned independently. Understanding the new technology requires time, which was reported as a concern by SLPs and teachers in the study [14].

Similar results were observed in another study performed at a particular school, where the authors found that AAC interventions require expertise, the HT-AAC is complicated, and a challenging level of knowledge is often necessary to operate it. This significantly burdens the communication partners’ and SLPs’ competence with HT-AAC [15].

Another study with parents of AAC users found they were optimistic about using HT-AAC for the opportunities it brings to the patients. However, they also used the term “effortful” for the technology. It was observed that parents found the implementation of HT-AAC difficult [16].

3.4 Perceived Resources:

3.4.1 Funding:

HT-AAC systems are costly and require funding for acquisition and maintenance. The access to HT-AAC for practitioners and patients was greatly limited due to funding-related issues [23]. The concerns related to reimbursement of costs attached to HT-AAC and the skilled SLP support required for it were also observed in another study. It was explored that it is either partially covered by insurance or not at all in some countries. United States started to reimburse the HT-AAC in 2001. However, the process of applying was tedious and exhausting [24]. Research conducted in the Philippines [25] found that funding might hinder AAC service provision in places with less healthcare resources. In another study, the battle for resources was highlighted as one of the critical barriers to AAC adoption, considering the costs associated with access to technology and support [15].

3.4.2 HT-AAC Literacy:

Like any other sophisticated technology, HT-AAC also comes with a need for learning. Several studies have highlighted this need that explicitly targets the practitioner's knowledge of AAC and its impact on adoption of HT-AAC among their patients. Access to skilled SLPs is a success factor among patients in adopting HT-AAC [18]. The patients need access, time, and literacy of HT-AAC to be trained for independent usage, which is only possible with proper support and training from a skilled SLP [4, 13]. Less than half of the SLPs' were found to be competent in AAC due to a lack of AAC education availability and pre-professional training in the Philippines, resulting in 90% of the SLPs only occasionally or rarely recommending HT-AAC to their patients [25]. Similar results were found in another study [14], where SLPs reported negative feelings among the staff (Teachers and other practitioners involved). Access to no training resulted in decreased participation, motivation, and abandonment of HT-AAC.

Another study [26] revealed that the SLPs highlighted the need for HT-AAC during their education, focusing more on the latest technologies and working knowledge of the devices. It was also found that the SLPs echoed the need for ongoing training for continued education of HT-AAC to provide better intervention to their patients.

3.4.3 Time:

Several studies have highlighted the importance of the time required to implement HT-AAC among patients. It was reported that the systems are often abandoned due to a lack of time to learn the technology, follow-up training, re-programming devices, and collaboration with the others involved [18-19]. Another aspect of the time-related barrier was discovered in a study where the patients reported frustration with the time the system took to formulate a message while communicating [4-11-12].

3.4.4 Support:

Implementing the HT-AAC among individuals with complex communication needs take an ecosystem of support. These include clinicians (SLPs, Operational therapists, Physicians), teachers, communication partners, family, and technical support. Environmental conditions were found to be one of the critical pitfalls associated with HT-AAC, including the supply of the devices and individual support for optimal usability of the technology. Ongoing support from service providers in the case of troubleshooting and maintenance was also found to be of crucial importance [13]. Support for caregivers was highlighted in a study stating that providing training to the caregivers is vital as they are one of the primary facilitators of HT-AAC to the patients. The caregivers’ concerns and attitudes increase the chances of successful AAC
adoption among the patients [18–27]. Lack of support from family members, clinicians, assistive technology specialists, and device manufacturers was the primary reason for the abandonment of HT-AAC among patients [18]. Similar results were recorded in a study where the loss of SLP support was the reason for HT-AAC abandonment rather than rejection of the technology [10].

3.4.5 Attitude & Behavioral Intention:

The attitude towards the use of HT-AAC is highly dependent on external factors. A study performed with the AAC particular interest group [18] highlighted the viewpoints of families, demonstrating elements of success such as receiving support from family, clinicians, and external consultants, demonstrating attitudes of realism, ownership, and appreciation for the system. It was also found in another research [4] carried out to identify barriers to AAC that the behavior of the patients towards adopting the technology is affected by several factors, including (among others) family support, ease of use, and knowledgeable staff.

4. RESULTS

Table 2: Themes and Subthemes for Thematic Analysis

<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
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<tbody>
<tr>
<td>Perceived Usefulness</td>
<td>Basic Communication</td>
</tr>
<tr>
<td></td>
<td>Education</td>
</tr>
<tr>
<td></td>
<td>Employment</td>
</tr>
<tr>
<td></td>
<td>Relationship &amp; Socializing</td>
</tr>
<tr>
<td></td>
<td>Patient Independence</td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>Learnability</td>
</tr>
<tr>
<td></td>
<td>Usability</td>
</tr>
<tr>
<td>Perceived Resources</td>
<td>Training &amp; Education</td>
</tr>
<tr>
<td></td>
<td>Ecosystem of support</td>
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<tr>
<td></td>
<td>Funding</td>
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<td></td>
<td>Preference</td>
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<td></td>
<td>Self-Motivation</td>
</tr>
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</table>
4.1 SLPs’ Perceived Usefulness of HT-AAC:

4.1.1 Basic Communication:

All the SLPs (n=10) advocated for HT-AAC being an effective communication method for their patients, allowing discourse in conversation. While they had varying reasons, they all resonated with the overarching subtheme of “Basic Communication.”

- **Novel Speech:** Some SLPs (n=4) stressed HT-AAC’s ability to produce novel utterances.
- **Vocabulary:** Few other SLPs (n=3) were more inclined towards the robustness and findability of the speech the HT-AAC offers.
- **Speech Generation:** Others (n=3) spoke about the value of voice output in HT-AAC. SLP7 also talked about the usefulness of speech generation.

4.1.2 Education

Several SLPs (n=6) highlighted the importance of HT-AAC in educating the younger populations. It was agreed that the usefulness of HT-AAC in the literacy of young ones is crucial not only to learning the language and essential communication but also to socializing with their peers and participating in the classroom environment. SLP5 highlighted the use of HT-AAC for interacting with fellow students for social growth.

The SLPs frequently stressed the raising concerns of the parents for their children’s pedagogical needs and for them to be able to interact in classroom activities with the other students.

4.1.3 Employment:

This subtheme resulted from various discussions around using HT-AAC to employ adult patients. Few of the SLPs (n=4) spoke about the role of HT-AAC in expanding employment opportunities to people with disabilities. Not only does it play an instrumental role in providing literacy to the younger ones, but those who were once working and lost their ability to communicate can use HT-AAC to continue their employment. The SLPs highlighted that HT-AAC enables patients to use the internet and various computer features, which is usually required in a job setting and is challenging to achieve using other communication methods.

The SLP5 specifically talked about the financial independence patients get using their AAC devices at their jobs, which ultimately increases their self-worth.

4.1.4 Relationships & Socializing:

A few SLPs (n=3) also advocated for how HT-AAC allows adult patients to maintain their relationships. They believed that the patients, having spent most of their lives as a typical person, have family/often children. Losing their voice, they urge to maintain those relationships with an AAC method that works for them. The SLP9 also shared similar views and spoke about keeping relationships old. Another exciting aspect of this
subtheme arose when most SLPs (n=8) spoke about the favorable outcomes of HT-AAC regarding socializing.

4.1.5 Patient Independence:

Most SLPs (n=7) agreed that HT-AAC enables patient independence and reduces caregiver burden. They reported that it improves patients' and their caregivers' quality of life. Not only can patients express their needs, wants, pain points, and feelings to their caregivers, but they are also able to contribute to their environment. SLP1 highlighted how all this psychologically impacts the patients as they feel self-sufficient.

4.2 SLPs’ Perceived Ease of Use of HT-AAC:

4.2.1 Usability:

The SLPs had varying opinions about the user-friendliness of the AAC systems. Most SLPs (n=8) thought using HT-AAC with prior knowledge is crucial and requires rigorous training from a trained SLP. They supported that while HT-AAC offers an easy-to-understand interface based on the mental model, the difficulty is sometimes the interface. The ability to communicate through a device by building language using page sets is not an instinct, so it needs to be learned over time. However, some of the SLPs (n=3) had a different opinion about the usability of HT-AAC. They highlighted how the systems are built to be user-friendly and are not difficult to use. They agreed that there is a learning curve, which is simple enough for the technology. SLP9 highlighted that frequency of use is also a factor that helps learn the technology faster.

4.2.2 Learnability:

Just as usability, the learning ability of HT-AAC also presented varying opinions by the SLPs. Only a few SLPs (n=4) agreed that the systems are easy when it comes to learning, considering that they have the support they need, consistent access to technology, and a trained SLP to train them. While the majority of SLPs expressed that the learning process is somewhat tricky. They believed so because learning HT-AAC is like learning a new language, which requires time and practice. The caregivers and the patients must also understand the technology. For some, it might be too technical to learn quickly. It was also highlighted that since HT-AAC requires goal-based customization, most patients need expert support.

4.3 SLPs’ Perceived Resources:

4.3.1 Training & Educating:

All the SLPs responded similarly to the importance of training and education on HT-AAC among the patients and caregivers. The acceptance of the HT-AAC was reported to have increased after the training sessions provided by AAC-skilled SLPs. Some of the SLPs (n=6) also agreed that previous negative experience associated with HT-AAC also impacts the acceptance of the technology. So, if they were not trained well in the past due to less experienced SLPs, incorrect device setup, or implementation, they would not be willing to use it moving forward.

4.3.2 The Ecosystem of Support Technical Support:

Among other things related to support, a few SLPs (n=4) highlighted the need for technical support with HT-AAC. It is the kind of assistance needed from the technology manufacturers, specifically in device breakdowns, software updates, and other such needs.

- **Family/Caregiver Support**: Almost all the SLPs advocated for this support needed to implement HT-AAC successfully. They claimed that proper family support is necessary for the patients to begin with this communication method. It was believed that a negative attitude from the caregivers, family, or communication partners often affects the patient's attitude toward HT-AAC.

- **External Support**: The SLPs also showed concern about the support patients receive from their educators or healthcare specialists. They mentioned that children need to use HT-AAC in educational settings, so they need their teachers to assist them. The SLPs specified that in the case of adult patients, however, they need their healthcare specialists to support this communication method. Not only should they have a positive attitude, but they also need to have a certain level of literacy of HT-AAC.

4.3.3 Funding:
Funding was seen as one of the biggest concerns among all SLPs. It was believed that the funding environment also dictates the patient’s success with AAC and ability to access it. In many countries, AAC funding is a huge problem, and since the technology is expensive, it is mostly not considered for these patients. A few SLPs (n=3) also pointed out that since getting access to the HT-AAC is often a lengthy process, as they must go through the funding process, this leads to relying on low-cost AAC apps available for tablets, which is not the best case for all the patients.

4.3.4 Time:

Several SLPs (n=6) agreed that time is a resource that can become a barrier to HT-AAC acceptance. They insisted that since there is a learning curve involved in getting trained with the technology, there is only sometimes enough time available during the training sessions or to access the technology to practice more. It was also mentioned that in some cases, the patients or their caregivers do not opt for HT-AAC as they are under the impression that it takes more time to learn.

4.4 SLPs’ Perception of Patients’ Attitude and Behavioral Intension towards HT-AAC:

4.4.1 Attitude towards HT-AAC:

The responses to the attitute towards HT-AAC yielded similar results from all SLPs. They experienced that if all the external variables like device usefulness, training, Ecosystem of support, and Time are checked off, the patients don’t feel pessimistic about the HT-AAC itself.

A few SLPs (n=4) specifically pointed out that if the patients find using HT-AAC complex to use, that discourages them from future use. Another viewpoint was shared by some of the SLPs (n=6) about the positive towards HT-AAC among younger populations.

4.4.2 Preference for HT-AAC:

Several SLPs (n=5) experienced that the patients would prefer HT-AAC over other communication methods if they had been trained well to use it. They believed that only then can the patient see the full potential of what HT-AAC offers for their well-being. It was also perceived by some SLPs (n=3) that the patients switched their preference to HT-AAC over time, especially if they still had access to their former communication method.

4.4.3 Self-Motivation:

This theme arises from various responses to the actual acceptance of the technology. Most of the SLPs (n=8) agreed that once the patient displays signs of taking ownership of their devices, they tend to use them long-term. If the patients show self-motivation to use the machine for performing various functions, they will continue using it.

4.5 SLPs’ Perceived Pitfalls in Acceptance of HT-AAC:

4.5.1 Implementation:

This pitfall was reported by almost all of the SLPs (n=9). Based on their experiences, the patients and their caregivers struggle with implementing the language. This includes how to model the language, add and grow the vocabulary in the device over the years, and where to place various words based on specific settings.

4.5.2 SLPs’ AAC Literacy:

Most SLPs (n=8) discussed the importance of HT-AAC literacy among professionals, specifically SLPs. They agreed that for successful implementation, SLPs must be skilled to a decent extent in HT-AAC. A few SLPs (n=3) also pointed out that many SLPs need to be better versed in HT-AAC as it was not taught in their education curriculum, and they need more time and resources to learn about it.

4.5.3 Performance/Speed:

Another frustration reported by all the SLPs was regarding the speed of communication generated by HT-AAC. They believed that the patients get frustrated most of the time due to the technology needing to be faster regarding speech generation. They said that most of the time, patients give up on saying what they
wanted to say in an ongoing conversation as the other person didn’t wait long enough for them to find words to say.

4.5.4 Bulky Equipment:

A few SLPs (n=2) also raised a concern about the size of the HT-AAC, as they usually tend to be heavier.

5. DATA ANALYSIS

This study aimed to investigate SLPs to understand the acceptance of HT-AAC among their patients and the potential barriers to acceptance. This will help answer the primary research question. For this purpose, Extended TAM [20] was used as a theoretical framework, and the acceptance for HT-AAC was found to be relatively high. The interview guide was prepared based on various components of extended TAM which gave rise to the initial themes. The responses yielded from the interviews were recorded and transcribed to identify how the participants interpreted and responded to these themes. The result was a set of sub themes that reflected the characteristics of the parent theme as seen in Table 1.

The results of this study highlight the positive perception of Speech-Language Pathologists (SLPs) regarding the benefits of HT-AAC for their patients. The findings emphasize the wide-ranging advantages of HT-AAC, encompassing essential communication needs, education, employment opportunities, social interactions, and overall independence.

However, there is a divergence in SLPs’ opinions on the ease of use and learnability of HT-AAC systems. While some find the technology user-friendly with a manageable learning curve, others perceive it as challenging, necessitating substantial training and time to attain proficiency.

Furthermore, the study reveals a consensus among SLPs on the importance of various forms of support, including technical assistance, family/caregiver support, and external support, to facilitate the successful implementation and acceptance of HT-AAC. They also express concerns about funding and time constraints as significant barriers that need to be addressed to improve access to AAC technology for those who could benefit from it.

Additionally, the research underscores the vital role of patient attitudes and self-motivation in the sustained use of HT-AAC. Finally, the findings identify several challenges that can impede the acceptance and adoption of HT-AAC, ranging from practical implementation issues to the necessity for greater professional literacy among SLPs in HT-AAC and concerns about the technology’s performance and physical aspects.

5.1 Data Analysis of Theme - Perceived Usefulness:

In delving into the data analysis of the theme centered around "Perceived Usefulness," the SLPs who participated in the study expressed their belief that HT-AAC serves the vital role of providing an alternative means of communication. A more detailed analysis demonstrates that HT-AAC accomplishes this by offering various advantages, including the ability to engage in conversations with a more extensive selection of vocabulary tools, produce speech that is more natural, and provide voice output. This finding aligns with the results of several previous studies on the same subject. In essence, it reaffirms that the SLPs in this study’s findings are consistent with the broader body of research in the field. It underscores the consensus that HT-AAC is indeed perceived as a valuable tool for improving communication [3-10].

Further analysis reveals the versatile applications of HT-AAC, spanning from educational support and peer collaboration among younger patients to extending employment opportunities to older adults. The technology’s capacity to facilitate these essential life aspects is well-documented in earlier research, highlighting its multi-faceted significance [11-12].

Additionally, the exploration of the results from this theme indicates the importance of maintaining relationships and promoting social interaction, underlining the broader social impact of HT-AAC. Which ultimately affects the quality of life of a patient with communication disorder. This matches what a previous study [13] discovered about how being independent affects patients and their caregivers positively.

It can also be analyzed that the Patients and caregivers find the technology helpful, which make patients more likely to keep using it in the long run. According to the Technology Acceptance Model a technology that is helpful, it leads to acceptance of it [20]. The findings from this study highlighting the usefulness of HT-AAC compared to other communication methods helps us answer research question 2.
5.2 Data Analysis of Theme - Perceived Ease of Use:

Upon closer examination on the second theme, regarding the Perceived ease of use of HT-AAC, SLPs had mixed opinions regarding the usability and learnability of the technology. It is mostly believed that HT-AAC can only be used with prior knowledge and requires rigorous training from a trained SLP. While it is acknowledged that the technical aspects, such as pressing buttons or navigating menus, are relatively easy to grasp. However, HT-AAC as a communication tool is like learning a new language, which takes time and practice. It can be analyzed from the result that building vocabulary through page sets is not intuitive compared to how humans naturally acquire vocabulary over the years from their surroundings from birth. It needs to be learned gradually by learning and practicing. This finding aligns with a prior study [14-15].

Going beyond the surface, an opposing view was also uncovered. It was also believed by a minority that HT-AAC systems are designed to be user-friendly and not challenging but requires some support. It can be analyzed that that there is a learning curve associated to this technology, it becomes easy to navigate and use with proper training and consistent technological access. This view contradicts findings from previous research [14].

Similar to usability, the SLPs' opinions regarding the learnability of HT-AAC were diverse. Examining the details it can be found that the systems are easy when it comes to learning, particularly when patients have the necessary support, consistent access to technology, and a trained SLP to guide them. This highlights that positive communication environments and skilled caregivers are essential for making the learning process easier. This coincides with the learning of prior research [14].

However, a contrasting view suggests that learning HT-AAC is difficult and can be compared to learning a new language. It can be analyzed from the findings that the learnability of HT-AAC is considered challenging when it comes to time factors and access to practice the technology. Moreover, it is not solely known by one person but rather as part of an ecosystem involving supporting patients. The customization aspect of HT-AAC based on individual preferences also adds to the complexity of the learning process, often necessitating expert support. This argument is supported by past research [15-16]. Findings from this theme answers our research question 3.

5.3 Data Analysis of Theme - Perceived Resources:

The third theme, i.e., Perceived resources, reflected on the needed resources for implementing HT-AAC successfully. An in-depth exploration of the data regarding training, it can be reflected that educating patients and their caregivers on the HT-AAC positively affects the acceptance of the technology. Proper training sessions provided by AAC-skilled SLPs increase HT-AAC acceptance among patients and caregivers. Additionally, adequate practice helps patients understand how to use the technology effectively and empowers them to communicate more confidently. For this it is important that the patients have access to the technology in all environments.

In the context of this particular result related to previous negative experiences with HT-AAC, insufficient training or incorrect implementation in the past can deter patients from adopting the technology. To avoid these experiences intervention from an AAC skilled SLP is crucial. These findings align with previous studies' evidence [4-13-18].

Expanding on the results related to Support, it is evident that there are various kinds of support needed for the successful implementation of HT-AAC. Firstly, Technical support from manufacturers is crucial to address device breakdowns, software updates, and other specialized needs. This finding resonates with a former study [13]. Secondly Family/caregiver support plays a vital role in helping patients embrace HT-AAC. Negative attitudes from caregivers or family members can hinder acceptance. External support from educators and healthcare specialists is essential, particularly for children using HT-AAC in educational settings. And finally, Healthcare specialists' support for adult patients with a certain level of HT-AAC literacy is crucial for prescribing and recommending appropriate solutions. With the whole Eco-system of Support, the adoption of the technology can be increased. The evidence of results in the study [18-10] resonates with this finding.

In the analysis of a subtheme “Funding” it can be interpreted that it is one of the major concerns affecting AAC acceptance. Limited access to funding can hinder patients from obtaining HT-AAC devices, especially in countries with adequate resources or where AAC technology is considered expensive. The lengthy funding process can lead some patients to opt for low-cost AAC apps on personal devices, which may only partially meet their needs. This coincides with the prior studies [23-15].
Another resource that was highlighted by SLPs was Time. Placing this finding in the larger framework, time is considered as a valuable resource that could impact HT-AAC acceptance. It is clear, that the learning curve involved in becoming proficient with the technology requires dedicated time, in terms of training sessions and practice. Time constraints in educational or therapeutic settings can also limit patients’ time to use HT-AAC, affecting their proficiency and acceptance. This finding coincides with the results of prior research [18-19]. The resources identified in this study also resonate with the constructs of Extended TAM and show how the absence of these resources impacts the ease of use and acceptance of HT-AAC [20].

5.4 Data Analysis of Theme - Perceived Attitude and Behavior:

In the final theme of this study, which was to examine the attitude and behavioral intention, The SLPs’ responses indicated that various external factors influence patients’ perception of the technology. The results highlight that when factors like device usefulness, skill training, a supportive ecosystem, and time are in place, patients tend to have a positive attitude toward HT-AAC. This finding resonates with the results of past research [4]. The negative sentiments towards the technology are often linked to broader issues such as loss of function, relationships, or life changes rather than inherent problems with the technology itself; this coincides with a prior study [13].

Digging deeper into the finding regarding AAC Preference, most of the patients normally prefer HT-AAC over other communication methods in the long term if they receive adequate training and support due to the benefits associated to the technology. It can be analyzed from the results that once patients become proficient in using HT-AAC and understand its capabilities, they are more likely to choose it as their primary method of communication. Additionally, patients might switch to HT-AAC over time, especially if they continue to have access to their previous communication method alongside the high-tech solution. This suggests that as patients become more comfortable and skilled in using HT-AAC, they may gradually shift their preference, even if they initially use a different communication method. Similar responses were found in the study carried out in the past [19].

Closer scrutiny of the results also reveal that once patients demonstrate signs of taking ownership of their AAC devices, they are more likely to use them in the long term. This sense of ownership and acceptance leads to increased motivation to use the technology; this can be backed by the evidence of findings in the study [14].

Finally, drawing connections with related findings it can be highlighted that the behavioral intention of the patients is affected by the availability of resources, and the usefulness of technology. This resonates with the components of Extended TAM [20].

5.5 Data Analysis of Perceived Pitfalls:

Several pitfalls were highlighted by the SLPs related to the acceptance of HT-AAC. Looking closely at the specifics of Implementation challenges, the patients and caregivers encounter difficulties implementing the language on AAC devices. This involves modelling the language, managing vocabulary and page sets, and determining when to add or modify them over time. Taking a more expansive view, we see that the initial years are particularly challenging for patients as they grapple with these implementation aspects. This finding can be backed up with the evidence from a study carried out earlier [16].

Further investigation reveals another major pitfall which is the AAC literacy among SLPs. Looking at this aspect in isolation, it can analyze that the importance of being skilled in HT-AAC is critical for successful implementation of the technology. Having knowledgeable SLPs specializing in HT-AAC is crucial, as it directly impacts patients’ adoption and usage of HT-AAC. A more comprehensive analysis reveals that for many professionals, HT-AAC is not included in their educational curriculum, and such lack of exposure and training can be a barrier to effectively utilizing the technology. Limited time and resources further hinder their ability to learn about HT-AAC. This finding also resonates with a prior study [14-25].

Another pitfall discussed by all the SLPs was related to the slowness of the speech generation. Focusing specifically on this finding, a common frustration is associated with the speed of communication generated by HT-AAC. The patients often need more support due to the slow speech generation of the technology, leading to awkward pauses or dead air space during conversations. Slow communication speed is a significant barrier, and efforts have been made to improve the technology’s efficiency. Findings from a prior study support this [11-12].

Some SLPs also expressed concerns about the size and weight of HT-AAC devices. Digging deeper into this finding, it can be highlighted that these devices are often presumed bulky, especially for patients with
complex medical needs. Adding additional piece of equipment can be burdensome for such patients and may raise worries about potential malfunctions or complications. This finding resonates with a prior study [4-18]. The results regarding the pitfalls of HT-AAC also answer research question 4.

6 SUMMARIZING DISCOVERIES: DISCUSSION

This research provides a glimpse into the acceptance of HT-AAC among patients by understanding the usefulness, ease of use, and resources related to the technology from the perspective of the SLP. In order to do so, the Extended Technology Acceptance Model was used to carry out this research. The motivation for choosing TAM for this study was because it is a well-established and widely used theoretical framework in the field of technology adoption and acceptance. It provides a structured approach to understanding users' perceptions and behaviors regarding technology. In the case of HT-AAC, understanding how SLPs and their patients perceive and accept this technology is crucial for successful implementation. The model has been used to explore technology acceptance from various technologies in industries like Healthcare, E-Learning, Human Computer Interaction and Telecommunications. While it is important to know the rationale behind choosing TAM, it is also essential to understand the limitations associated to it. One major critique center around the absence of subjective norms or considerations of social impact within the original TAM framework. Subjective norms refer to the influence of social factors and norms on an individual's decision to adopt technology. In consumer contexts, where choices are often influenced by social and peer considerations, the absence of subjective norms in TAM is a notable limitation. Secondly, TAM provides insights into users' perceptions, but it falls short in providing actionable information on how to improve the design and functionality of technology to better meet user needs and preferences.

From a theoretical perspective, the findings from this study served as a mark to inform about the current acceptance of HT-AAC using extended TAM. From a practical standpoint, the significance of these findings lies in their potential to inform and improve the use of HT-AAC. For instance, SLPs and other healthcare professionals can use these findings to enhance their AAC intervention strategies. They can tailor their approaches to meet the needs of individual patients better. The results emphasize the importance of specialized HT-AAC literacy among SLPs and other professionals. Healthcare institutions and educational programs can use this information to design and implement training programs that equip SLPs with the necessary skills and knowledge to work with HT-AAC devices effectively. Device manufacturers like Tobii Dynavox can use these findings to develop more user-friendly and efficient HT-AAC technologies considering the pitfalls and challenges that often lead to abandonment of the HT-AAC.

However, several challenges to HT-AAC acceptance were identified. The implementation process, including language modelling, vocabulary growth, and page set organization, was reported to be a significant hurdle for both patients and caregivers. SLPs emphasized the need for specialized HT-AAC literacy among professionals to ensure successful implementation and support for patients. Technical issues, mainly speed and efficiency, were also noted as potential barriers to acceptance. Support from caregivers, healthcare professionals, and manufacturers of HT-AAC, emerged as critical for acceptance. Adequate training and education for patients and caregivers, technical assistance, and positive attitudes from educators and healthcare specialists were highlighted as essential elements. However, funding constraints can hinder HT-AAC adoption, especially in regions with limited resource access. The SLPs confirmed that patient attitudes towards HT-AAC were generally positive despite challenges, especially with proper training and support. Patients who displayed self-motivation and took ownership of the devices were likely to continue using HT-AAC long-term.

Based on Extended TAM [20], usefulness positively impacts behavioral intention; the SLPs confirmed this about their patients. Moreover, the model suggests that ease of use positively impacts the usefulness and attitude of the user. The SLPs believed the technology is easy to use once it is learned. They confirmed that with required resources like training, funding, support, and time, the technology can be learned smoothly, making it easy to use and ultimately affecting the behavioral intentions of the patients in a positive way. Given that, the SLPs perceive the acceptance of HT-AAC as high among their patients. This answers the primary research question 1.

6.1 Implications.

SLPs should receive specialized training in HT-AAC to guide patients in using the technology effectively. Implementing HT-AAC can be challenging, particularly in modelling language, organizing vocabulary, and setting up page sets. Identifying and addressing these challenges during training sessions is essential to reduce frustration and improve patient acceptance. Designing HT-AAC devices with user-friendliness in mind can contribute to better acceptance. The devices' overall language modelling and use may require
improvements to enhance user-friendliness. Building a solid support ecosystem is essential for successful HT-AAC implementation. This Ecosystem includes technical support from manufacturers for device maintenance and updates and family and caregiver support in using and implementing the technology. Additionally, educators and healthcare specialists must support patients' use of HT-AAC in educational and medical settings.

The findings highlight the need for accessible funding options, especially in regions where HT-AAC technology might be expensive and challenging. Funding access can enable more patients to benefit from HT-AAC devices and support long-term usage. Technological advancements should focus on reducing delays in speech generation, streamlining navigation, and enhancing user interface efficiency. Improving speed and efficiency can increase patients' motivation to use HT-AAC and strengthen their communication experiences.

6.2 Strengths & Limitations:

There were a few limitations in this study. The results were collected using a small sample size, so they must be interpreted cautiously as they may not reflect the views of all the SLPs. Moreover, the credibility of the results could have been strengthened by employing supplementary triangulation methods. Furthermore, the study was conducted with US and Canada based SLPs so that the findings may differ from other parts of the world. Future research may focus on expanding this study in other countries and a bigger sample size.

6.3 Pathways for Future Inquiry: Recommendations for Subsequent Research:

Governments and organizations can also work on improving funding and access to HT-AAC for those in need. Advocacy efforts can be strengthened by sharing these research outcomes with policymakers, healthcare providers, educators, and the public. This can lead to increased support for funding, research, and accessibility of HT-AAC devices. By addressing the challenges and capitalizing on the benefits, these findings can contribute to creating a more inclusive and communicatively empowered society.

6.4 Conclusion:

In conclusion, the findings from this study provide valuable insights into the acceptance and usability of this technology among individuals with complex communication needs. The study highlights several important themes that impact HT-AAC's successful implementation and long-term usage. HT-AAC was seen as a powerful tool that enables patients to communicate effectively, participate in various activities, and enhance their overall quality of life. However, the study also identified several pitfalls and barriers that hinder HT-AAC acceptance. Issues related to implementation, AAC literacy among SLPs and caregivers, device performance and speed, and concerns about bulky equipment were major challenges. Funding and time constraints were also significant barriers to accessing and learning to use HT-AAC effectively. The study further highlighted the importance of proper training and education for both patients and caregivers. SLPs are critical in ensuring successful HT-AAC implementation, and their specialized literacy in this technology is essential.

Patient attitude and preference for HT-AAC played a significant role in its acceptance. By leveraging these findings, we can create a more inclusive society where HT-AAC empowers patients to overcome communication challenges and improve their overall quality of life.
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