



Exploring the School Experiences of Students Using Augmentative and Alternative Communication (AAC): A Qualitative Study from Parental Perspectives

Original scientific paper

Mohammed Abdulaziz Almutairi

Department of Special Education, College of Education, University of Jeddah, Jeddah, Saudi Arabia

Received: 2024/11/02

Accepted: 2025/01/25

Abstract

The aim of this study was to explore the experiences of children using augmentative and alternative communication (AAC) in inclusive primary schools from their parents' perspectives. Semi-structured interviews with 18 Saudi Arabian parents provided insights into the academic, social, and emotional challenges their children face, along with the support they receive from teachers. The analysis highlighted both the benefits of AAC and key challenges, such as limitations of low-tech devices, the lack of culturally suitable options, and gaps in teacher training. These challenges affected students' learning, social connections, and emotional well-being. The findings emphasize the need for culturally adapted AAC systems and more consistent teacher training to support AAC use effectively within inclusive settings. By focusing on parents' perspectives, this research offers a foundation for enhancing AAC integration to better support students' development.

Keywords: *Augmentative and Alternative Communication, Inclusive Education, Primary Schools, Parental Perspectives*

Students with communication disorders face significant challenges navigating both academic and social environments within schools. For those who need to use augmentative and alternative communication (AAC) systems, these difficulties are even more pronounced, as

traditional communication methods may not be sufficient to meet their needs (O'Neill & Wilkinson, 2020). Aided AAC systems, ranging from low-tech to high-tech options, are essential in rehabilitation, offering alternative ways for individuals with limited speech to communicate and engage socially

(Alzrayer, 2020; Iacono et al., 2022). While parents often report notable improvements in their children's communication when using these systems, challenges such as lack of motivation and insufficient support from schools still persist (Joginder Singh et al., 2023). These problems highlight that, despite its benefits, the effective use of AAC in schools can be negatively influenced by a variety of factors, such as the school environment, availability of support, and individual student needs (Leatherman & Wegner, 2022).

Research has demonstrated both the benefits and limitations of AAC systems in educational settings. High-tech AAC devices allow for quicker communication and greater expressive possibilities, helping students contribute to class discussions more effectively (Holyfield et al., 2019). In contrast, low-tech systems are more accessible and easier to implement but may limit students' ability to convey more complex ideas in fast-paced environments (Moorcroft et al., 2019). A study by Holyfield and Lorah (2023) emphasized the limitations of low-tech AAC devices compared to high-tech options, including lower engagement from children and a reduced ability to support complex communication needs. These differences reflect both the successes and challenges AAC users encounter at school, where the technology's impact is shaped by its design and implementation.

AAC systems play an essential role in students' social experiences, facilitating peer interactions and helping build friendships, which supports participation in social activities (Iacono et al., 2022). However, traditional AAC technologies often limit children's access to a wide range of vocabulary, primarily because of difficulties in programming relevant words. According to Light et al. (2019), these vocabulary limitations restrict language development and the ability to engage in social interactions effectively. The slow process of updating vocabulary in AAC systems also impedes real-time participation in fast-paced conversations, further highlighting the shortcomings of current AAC technologies (Light et al., 2019).

Despite the challenges, parents frequently express satisfaction when they observe their children using AAC devices successfully. According to Joginder Singh et

al. (2023), AAC systems help parents better understand their children, enhancing their mutual communication. However, many parents also report that the use of AAC in school settings is limited, particularly when there is insufficient support from teachers or a lack of necessary time, knowledge, and skills to implement these systems effectively (Joginder Singh et al., 2023). This indicates that more comprehensive training and support in school environments are needed to maximize the benefits of AAC for students.

In addition to enhancing their academic and social experiences, the use of AAC systems has a significant impact on students' emotional well-being. A study found that AAC interventions, such as video visual scene displays, contributed to increased self-esteem and a sense of accomplishment as students were able to engage in meaningful volunteer activities (Babb et al., 2020). However, frustration is also a significant theme of AAC use, as individuals often experience difficulty expressing themselves quickly, conveying their personality through synthetic voices, and managing privacy in their communications (Broomfield et al., 2024). The mixed responses, both positive and negative, underscore the complex influence of AAC on students' emotional experiences in school.

There remains a significant gap in our understanding of parents' perspectives on AAC use, particularly in non-Western contexts. This study aims to fill this crucial gap in the literature as the first to gather perspectives from parents in Saudi Arabia on their children's experiences with AAC in school settings. The aim of this qualitative research is to provide a detailed understanding of how AAC systems impact students' academic success, social interactions, and emotional well-being. By exploring these challenges and successes, this study contributes valuable insights into how AAC systems can best support students' overall development and hopes to guide future efforts to support AAC implementation in diverse educational settings.

Research questions:

1. What experiences do parents have regarding their children's use of AAC in inclusive primary education?
2. What improvements do parents suggest for enhancing AAC use in inclusive primary education?

Method

Research Design

This study is grounded in interpretative phenomenological analysis (IPA), a qualitative research approach that explores how individuals make sense of significant experiences in their lives (Larkin et al., 2021). IPA was selected for its ability to capture parents' interpretations of their children's experiences with AAC in school settings, offering a nuanced understanding of them. Qualitative research is particularly valuable for exploring such complex, subjective experiences, as it provides depth and insight that quantitative methods may not represent (Merriam & Tisdell, 2015). The qualitative analysis used in this study allowed for an in-depth exploration of participants' lived experiences, revealing the essence of parents' perspectives and the meanings they attribute to their children's school experiences (Creswell & Poth, 2023; van Manen, 2023).

Participants and Sampling

Purposive sampling was employed to recruit parents of students who use AAC in school settings for individual interviews. Compared to convenience sampling, purposive sampling is more suitable for identifying individuals who can provide in-depth insights into the research questions (Etikan et al., 2016). This method was therefore chosen to ensure that participants were well-positioned to contribute meaningfully to the research objectives and had direct and relevant experiences with AAC, allowing for the collection of rich, detailed data (Nyimbili & Nyimbili, 2024; Patton, 2015).

Inclusion criteria

The inclusion criteria were as follows:

- parents of children in primary school (first to sixth grade) who use AAC as their primary mode of communication in inclusive education settings;
- children who had been using AAC for at least one academic semester;
- parents who had regular communication with their child's school regarding their child's educational experiences.

Recruitment Methods

Participants were recruited using social media and flyers distributed in inclusive schools. Social media was used as it is effective for reaching a wide range of targeted participants who meet the inclusion criteria (Zindel, 2023). Flyers were chosen because they allowed parents to see the information multiple times, which often prompted them to make inquiries about the study. Both social media posts and flyers provided details about the study's purpose, eligibility criteria, and a link to the Google Form. Recruitment took place over two months, with initial efforts focusing on social media and flyers, followed by expanded efforts in the second month. Weekly monitoring allowed for adjustments, such as posting during peak times. Participants accessed a Google Form to learn about the study, including its purpose, confidentiality policy, and ethics approval, and provided their contact preferences for follow-up. Follow-up began within a week of submission, with a second attempt after five days if needed to ensure efficient scheduling. A total of 18 parents participated in the study through one-on-one interviews. This sample size aligns with recommendations for qualitative research, which suggest that individual interviews lead to more in-depth discussions, especially when addressing complex topics (Ryan et al., 2009). The final sample consisted of 12 fathers and six mothers, ranging in age from 28 to 48 years ($M = 37.06$, $SD = 5.83$). The children attended inclusive education schools and were in Grades 1 to 6 ($M = 3.33$, $SD = 1.57$). In terms of educational background, five participants had a high school diploma, 11 held a bachelor's degree, and two held a master's degree. Regarding the type of AAC used by their children, 15 used low-tech and three used high-tech AAC devices. Eight of the parents' children were diagnosed with autism spectrum disorder (ASD), five with intellectual disabilities, four with apraxia of speech (AOS), and one with dysarthria. To protect participant confidentiality, demographic information is presented in aggregate form (Table 1).

Table 1.
Characteristics of Participants

Participant ID	Gender	Age	Highest degree received	Type of AAC used by child	Type of disability	Child's school grade
P01	Male	33	Bachelor's degree	Low-tech	Autism spectrum disorder (ASD)	2nd
P02	Male	45	High school	High-tech	Intellectual disability (ID)	2nd
P03	Female	32	Bachelor's degree	Low-tech	Apraxia of speech (AOS)	4th
P04	Male	34	Bachelor's degree	Low-tech	ASD	3rd
P05	Female	32	High school	Low-tech	ASD	5th
P06	Female	34	Bachelor's degree	High-tech	ID	1st
P07	Male	31	Master's degree	Low-tech	ID	4th
P08	Male	48	Bachelor's degree	Low-tech	ASD	2nd
P09	Male	36	Bachelor's degree	Low-tech	ASD	4th
P10	Female	39	Bachelor's degree	Low-tech	AOS	4th
P11	Male	47	Bachelor's degree	High-tech	ASD	5th
P12	Male	35	Master's degree	Low-tech	ID	2nd
P13	Male	44	High school	Low-tech	ASD	3rd
P14	Male	33	High school	Low-tech	AOS	2nd
P15	Male	37	Bachelor's degree	Low-tech	Dysarthria	4th
P16	Male	41	High school	Low-tech	ID	6th
P17	Female	38	Bachelor's degree	Low-tech	ASD	6th
P18	Female	28	Bachelor's degree	Low-tech	AOS	1st

Note. ASD = autism spectrum disorder; ID = intellectual disability; AOS = apraxia of speech.

Data Collection

Data were collected over Zoom and by phone using 18 one-on-one semi-structured interviews with parents of children using AAC in Saudi schools. Eight interviews were conducted via Zoom, and nine were conducted over the phone. This mixed approach ensured flexibility in accommodating participants' preferences, allowing for the thorough capture of each parent's unique insights (Saarijärvi & Bratt, 2021). Interviews lasted between 55 and 81 minutes, providing sufficient

time for participants to elaborate on their experiences while maintaining their engagement. Semi-structured interviews involve a flexible interview style whereby a set of predetermined questions guide the conversation, but the interviewer can explore topics as they arise, allowing for deeper insights into the participants' perspectives (Kallio et al., 2016; McGrath et al., 2019). According to Hennink and Kaiser (2022), data saturation is typically reached with between nine and 17 interviews. With 18 participants, the current study reached

saturation, ensuring that key themes were thoroughly captured.

Prior to data collection, pilot tests were conducted with two parents to evaluate the clarity and relevance of the interview questions. Feedback from these pilot tests confirmed that the questions were appropriate, and minor adjustments were made to improve clarity (Creswell & Creswell, 2022). Before commencing the interviews, all participants received and signed a detailed consent form outlining the study's purpose, their rights, and confidentiality measures. Participants were informed of their right to review interview transcripts to verify accuracy and were assured they could withdraw from the study at any time. These measures ensured that ethical standards were rigorously upheld throughout the research process (Pietilä et al., 2020).

Data Analysis, Translation, and Trustworthiness

Data were analyzed using IPA as described by Smith et al. (2021), which provided an in-depth exploration of participants' experiences. Given the bilingual nature of the study, a careful translation process was incorporated to preserve cultural and linguistic nuances (Qoyyimah, 2024). Individual interviews were transcribed verbatim in Arabic by a native Arabic-speaking research assistant with expertise in qualitative research, ensuring accuracy and confidentiality. The primary researcher then reviewed each transcript thoroughly to develop a deep understanding of the content (Alase, 2017).

Initial coding focused on identifying key phrases, linguistic features, and conceptual elements while preserving cultural nuances (Nurjannah et al., 2014). Throughout the coding process, memo-writing was used to document emerging thoughts and reflections, grounding interpretations in the data (Goitom, 2020). As the analysis progressed, themes were identified that captured the participants' shared experiences. To reduce bias, an independent researcher reviewed these themes.

This comprehensive process ensured that the final themes accurately captured participants' experiences, with each step thoroughly documented to maintain transparency and accountability (Ozolins et al., 2020). To ensure trustworthy findings, multiple validation methods were employed. Intercoder agreement involved two additional coders recruited independently, targeting a reliability rate between 85% and 90%. Discrepancies were discussed and resolved through joint coding sessions until a consensus was reached, achieving a final agreement of 92%. This high level of agreement demonstrated consistency among the coders and reduced individual bias, thereby enhancing the rigor of the analysis (Cheung & Tai, 2023). Member checking allowed participants to verify that their voices were accurately represented. They reviewed their interview transcripts and the initial interpretations in Arabic and were given two weeks to provide feedback. All of their suggestions were carefully considered and incorporated into the analysis, adding credibility to the findings (Creswell & Creswell, 2022). Additionally, peer debriefing was used as a complementary validation strategy. Two colleagues with expertise in qualitative research, who were not involved in the data collection, reviewed the emerging themes and interpretations. Their role was to challenge assumptions and provide an external perspective, helping to refine the themes and ensuring that the interpretations were well-supported by the data (Janesick, 2015).

Results

The analysis of the participants' responses revealed several key themes and sub-themes that reflect their experiences with AAC systems, providing insight into specific encounters with system features and their impacts on education, social development, and emotional well-being, as well as parental recommendations. Table 2 summarizes the major themes and sub-themes, along with the number of participants who mentioned each sub-theme (Table 2).

Table 2.*Major Themes and Sub-Themes of the Participants' Experiences with AAC Systems*

Major Themes	Sub-themes	<i>n</i> of participants (N=18)
AAC system features	a. Communication limitations due to low-tech systems	17
	b. Cultural and contextual appropriateness of AAC	16
	c. Limited AAC options in schools	15
Educational impact	a. Academic challenges due to slow AAC systems	18
	b. Teacher support and adaptations	16
	c. Barriers to academic progress	14
Social development	a. Peer interactions and friendship challenges	17
	b. The role of teacher interactions in social inclusion	15
	c. Difficulties dealing with group dynamics	13
Emotional well-being	a. Frustration resulting from communication barriers	16
	b. Emotional support from school staff	15
Parental feedback and recommendations	a. Improving teacher training and policies	17
	b. Improving AAC device options	16

The following sections explore each theme and sub-theme in detail, with explanations supported by participant quotes:

Theme 1: AAC System Features

This theme explores the characteristics of AAC systems, and the challenges children face in using them, as viewed from their parents' perspectives. It focuses on the following three key areas: the communication limitations of low-tech systems, the cultural and contextual appropriateness of AAC systems, and the limited availability of AAC options in schools.

Sub-Theme 1: Communication Limitations Due to Low-Tech Systems

Participants discussed how the technical features of AAC systems, especially low-tech options, restrict students' ability to communicate effectively. Parents expressed concerns regarding limited vocabulary availability and slow response times, which made it difficult for students to convey complex thoughts or emotions. P03 explained this limitation and its impact as follows: *"When my son wants to participate in class discussions, it takes him so long to find the right words on the AAC that the conversation has already moved on by the time he's ready. It makes him feel left out."*

Sub-Theme 2: Cultural and Contextual Appropriateness of AAC

This sub-theme highlights concerns about the cultural relevance and contextual suitability of AAC systems. Participants noted that many AAC systems are designed for Western cultural contexts and lack culturally appropriate language and symbols relevant to students in Saudi Arabia. This cultural mismatch limits the system's utility in everyday life. As P02 stated, *"The AAC system doesn't have words that are important in our culture, and my child has no way of talking about the things that matter to him at home or in his social life."*

Sub-Theme 3: Limited AAC Options in Schools

Many parents were concerned about the availability of AAC options in schools. Participants reported feeling restricted in their ability to choose AAC systems that best suited their children's individual needs. Most parents noted that schools predominantly offer low-tech systems, such as Picture Exchange Communication Systems (PECS), which are useful for basic communication but fail to offer the full range of expression that students require. For example, P01 shared: *"We were told by the school that they only offer a basic AAC, but it's not enough for my child. Most of the options we've seen*

are low-tech, and we've had to use PECS. It doesn't give my child the full range of expression he needs."

Theme 2: Educational Impact

This theme explores how AAC systems influence students' educational experiences, focusing on the challenges they face in the classroom. It is divided into three key areas: the academic issues caused by the slow processing of AAC systems, the role of teacher support and adaptations in facilitating learning, and the barriers to academic progress in more complex subjects. Each sub-theme is supported by participants' insights into how AAC systems affect classroom participation, learning engagement, and students' ability to excel in more demanding academic areas.

Sub-Theme 1: Academic Challenges Due to Slow AAC Systems

Participants discussed how AAC systems influenced their child's ability to engage in academic tasks such as completing assignments, answering questions, and participating in classroom activities. Parents noted that while AAC systems helped with accessing academic content, using the devices was time-consuming, making it difficult for their children to keep up with the pace of lessons. As P09 explained: *"In subjects like art, my son can manage with the AAC system, but when it comes to subjects that need more in-depth discussion, like math, he struggles. The device can't keep up with the level of communication needed to express his thoughts fully."*

Sub-Theme 2: Teacher Support and Adaptations

This sub-theme focuses on the role of teachers in supporting students' use of AAC systems. Participants noted that effective adaptations, such as providing pupils with additional time to respond and visual supports, significantly improved their children's learning experience. Teachers who received adequate training in AAC were better able to facilitate their students' academic engagement. However, inconsistent teacher training in AAC led to uneven adaptations across classrooms. P17 shared that *"Some teachers are great at giving my son extra time to respond or using visuals to help him understand the lesson. But others don't seem to know how to adapt their teaching, so he struggles more in those classes."*

Sub-Theme 3: Barriers to Academic Progress

Participants noted that AAC systems often posed barriers to academic progress in subjects that required abstract thinking or quick responses, such as math. While AAC systems were useful for basic communication, they were less effective when students needed to express more complex ideas, which affected their ability to perform well in certain subjects. P07 explained, *"In subjects like math, my son struggles with the AAC system because it takes too long to input answers, and the device can't keep up with the complexity of the content."*

Theme 3: Social Development

This theme explores how AAC systems impact students' social interactions and development within the school setting. The focus is on three key areas: the challenges students face in peer interactions and forming friendships, the role of teachers in facilitating social inclusion, and the difficulties students encounter when participating in group dynamics. Parents shared insights into how AAC systems both help and hinder their child's ability to build meaningful social relationships and participate in group settings.

Sub-Theme 1: Peer Interactions and Friendship Challenges

Parents highlighted the significant role that AAC plays in their child's ability to interact with peers, particularly during structured activities like group work or classroom exercises. Participants noted that while AAC allows their children to engage in basic social exchanges, it often falls short during more nuanced or spontaneous interactions. Several parents mentioned that their children relied on nonverbal communication or pre-programmed phrases to navigate one-on-one social interactions. For example, P06 shared: *"My son uses his AAC system to say things like 'let's play,' but when his friends start joking around or talking quickly, he can't keep up. It makes him feel like he's not really part of the group."*

Sub-Theme 2: The Role of Teacher

Interactions in Social Inclusion Teachers play a critical role in supporting the social inclusion of students who use AAC. Participants discussed how teachers' engagement with their children varied

significantly. Some teachers actively facilitated peer interactions, modeling how to communicate with AAC users and encouraging social connections in the classroom. However, other teachers lacked confidence or training in integrating AAC into both academic and social exchanges. P15 noted: *“One of my daughter’s teachers would always make sure to include her in class discussions, asking her direct questions and waiting for her to respond. This helped her feel more connected to both the teacher and her classmates.”*

P11, however, had a different experience: *“My child’s teacher often avoids using the AAC system altogether because she’s unsure how to incorporate it into social interactions.”*

These findings clearly demonstrate the impact of teacher support on social development. Teachers who proactively engage AAC users help bridge communication gaps, fostering a sense of belonging and participation in the classroom. However, inconsistent teacher involvement leads to missed social opportunities, affecting how well students integrate with their peers. These observations highlight the need for comprehensive teacher training to support AAC users in both academic and social contexts.

Sub-Theme 3: Difficulties Dealing with Group Dynamics

Participants noted that their children faced difficulties participating in group activities, particularly in dynamic social settings like playgrounds or during group projects. The slower communication pace required by AAC systems often excluded students from fast-paced conversations, making it difficult for them to contribute to group interactions in real time. P12 summarized this challenge experienced by many of the children: *“My son has one close friend who understands his AAC and waits for him to respond, but when they’re in larger groups, it’s hard for him to keep up with the conversation. He sometimes feels like he’s on the outside looking in.”*

Theme 4: Emotional Well-Being

This theme examines how AAC systems affect students' emotional well-being, highlighting the frustration caused by communication barriers and the crucial role school staff play in providing emotional support. Parents described the emotional

challenges their children face due to AAC’s limitations and how teacher support helps alleviate these issues.

Sub-Theme 1: Frustration Resulting from Communication Barriers

Participants discussed the frustration caused by the limitations of AAC systems. Parents expressed concern over their child’s emotional well-being, noting that the inability to communicate freely often led to feelings of isolation, helplessness, and anger. This frustration frequently manifested in emotional outbursts or withdrawal from attempts to engage with others. As P08 explained, *“My son tries so hard to tell me what he’s thinking, but when the AAC device doesn’t have the words, he needs or it takes too long, he gets so frustrated. Sometimes he just throws the device away in anger and stops trying to talk at all.”*

Sub-Theme 2: Emotional Support From School Staff

This sub-theme focuses on the role of teachers and school staff in providing emotional support for students who use AAC. Participants noted that teachers made a crucial contribution to helping students manage the emotional challenges of communication. Teachers who took the time to check how students were feeling helped foster a sense of ease and comfort in the classroom. For example, P04 shared: *“One of the most amazing things I’ve seen is how my daughter’s teacher always checks in with her emotionally before and after class. This really helps her feel more at ease, especially after a tough day when she couldn’t communicate well.”*

Theme 5: Parental Feedback and Recommendations

This theme presents parents’ suggestions for improving the use of AAC systems in schools. Parents’ recommendations focused on enhancing teacher training, developing policies to provide consistent support, and advancing AAC device functionality to better meet students' needs. Parents shared how these changes could enhance their children's educational and social experiences.

Sub-Theme 1: Improving Teacher Training and Policies

Parents recommended comprehensive teacher training to ensure that all educators are proficient at using AAC systems. They also suggested that schools adopt

standardized policies for AAC integration to ensure that students receive consistent support across classrooms. P05 explained why these changes would be necessary: *“In certain classrooms, teachers demonstrated effective use of AAC devices, which allowed for greater participation from students. But in others, the devices remained unused because the teachers didn’t know how to incorporate them.”*

Sub-Theme 2: Improving AAC Device Options

Many parents emphasized the need for more advanced AAC devices that better meet students' communication requirements. The low-tech systems currently in place were inadequate, limiting students' ability to express more complex thoughts. P02 mentioned that *“The AAC my daughter uses is so basic—it doesn’t allow her to express herself the way she wants to. Schools need to provide AAC devices with advanced features, such as predictive text and customizable vocabularies.”*

Discussion

The findings of this study highlight important challenges in using AAC systems, consistent with prior research. Leatherman and Wegner (2022) noted that educational environments with limited inclusivity can reduce opportunities for students using AAC to communicate and learn effectively. Parents in this study described similar challenges, emphasizing the need for high-tech AAC systems to address complex communication needs in schools. They also stressed the importance of comprehensive teacher training, noting significant variations in teachers' familiarity with AAC devices. Inconsistent training led to unequal adaptations across classrooms, limiting students' ability to participate fully. These findings are reflected in the subthemes *“teacher support and adaptations”* and *“barriers to academic progress”*, which underscore the need for consistent training and effective AAC integration to improve communication, academic outcomes, and social inclusion. These overlapping barriers underscore the critical need for advanced AAC options to address the challenges faced by students using AAC. The findings highlight educational implications,

particularly regarding the development and optimization of AAC technologies. For instance, Broomfield et al. (2024) documented the frustrations of AAC users when communication devices lacked responsiveness, highlighting how delays in device functionality can disrupt interactions. One participant in their study reported that such delays hindered their ability to engage in conversations, resulting in feelings of exclusion. These challenges emphasize the importance of designing AAC systems that are more efficient and responsive to the demands of inclusive education. Similarly, Wilkinson and Wolf (2021) noted that delays in AAC response times hinder students' participation in group activities, increasing social isolation. Research shows AAC systems often lack the speed and adaptability needed for complex academic tasks (Frick Semmler & Bean, 2023). In line with these findings, parents in this study observed that inconsistent teacher training led to unequal classroom adaptations, reducing access to communication support. Addressing these challenges requires collaboration between educators and speech-language pathologists to improve teacher preparation for integrating AAC devices. This approach ensures students using AAC can fully engage in academic and social activities.

Cultural considerations also emerged as a critical factor influencing the effectiveness of AAC systems, especially in non-Western contexts like Saudi Arabia. Parents emphasized that existing AAC tools often lack culturally appropriate language and symbols. Similarly, Joginder Singh et al. (2023) noted that most AAC systems are designed for English-speaking populations, limiting culturally relevant options for non-Western users. Amery et al. (2022) also highlighted this issue, stating that AAC systems remain underdeveloped for minority and Indigenous languages, which poses additional challenges for users. To address these barriers, AAC developers must prioritize cultural and linguistic diversity in their designs. Collaborative efforts between schools and developers can ensure the creation of AAC systems that meet the cultural needs of students, allowing them to communicate effectively in both academic and social contexts.

Social challenges, particularly in forming reciprocal friendships and

participating in group activities, are a significant concern for children using AAC. Biggs and Snodgrass (2020) highlighted difficulties in forming friendships due to differences in engagement and communication methods, such as gestures, vocalizations, and aided AAC. Similarly, Hyppa-Martin et al. (2021) reported that slower communication speeds with AAC systems often limit children's participation in group discussions, making social integration more difficult. Parents in the study echoed these findings, noting that their children frequently faced social exclusion due to the limitations of low-tech devices. Addressing these challenges requires advanced AAC systems. High-tech devices that enable faster and more dynamic communication can improve peer relationships and foster social inclusion. Additionally, Communication barriers have a significant impact on students' emotional well-being, highlighting the need for support systems that integrate technological and social solutions (Noyek et al., 2022). Parents shared that their children often felt isolated and frustrated due to communication challenges, particularly when unable to express their thoughts effectively. These parental accounts align with findings from Murray and Hopf (2022), who observed that communication barriers frequently lead to emotional strain and a decline in motivation. O'Neill and Wilkinson (2020) further noted the adverse effects on self-advocacy, especially in cases where communication demands are excessive, such as delays in AAC device responses. In addressing these challenges, teachers who provided consistent emotional check-ins helped reduce students' frustration and fostered resilience. These findings echo those of Broomfield et al. (2024), who demonstrated that regular emotional support from educators alleviated students' stress and improved their confidence in communication.

Parents identified two key areas for improvement: teacher training and access to advanced AAC devices. Variability in AAC use across classrooms highlights the need for comprehensive teacher training to ensure consistent implementation. Flores and Dada (2024) reported that educators with formal AAC training use these systems more effectively, leading to significant improvements in students' communication outcomes. Aldabas (2022)

similarly emphasized the importance of teacher training in the Saudi context, where inconsistent use of AAC systems remains a challenge. Globally, studies have shown that schoolteachers often lack the knowledge, skills, and necessary training to teach students using AAC (Da Fonte et al., 2022; Aldabas, 2020). This finding aligns with the current study, where parents reported the need for improving teachers' training on AAC use. Additionally, parents emphasized the importance of advanced AAC devices with features like predictive text and customizable vocabularies to better support their children's needs. These features address challenges in academic and social settings, where low-tech devices, though useful for basic communication, often fall short. Building on this, Syriopoulou-Delli and Eleni (2022) found that advanced AAC systems enhance students' ability to express themselves and enable more active participation in both school and social activities. Thus, providing access to such tools is essential for improving the educational and social experiences of AAC users.

Implications for Practice and Research

The experiences of students using AAC systems in schools, as reported by their parents, reveal technical and cultural challenges, particularly in non-Western contexts, such as slow response times and linguistic mismatches. One major issue is slow response times in AAC tools, which hinder real-time communication during activities such as math problem-solving and group discussions. These challenges highlight the need for responsive systems to support classroom participation, particularly in resource-limited countries reliant on low-tech AAC.

Artificial intelligence (AI) has potential to improve AAC devices by enabling features such as predictive text and real-time adaptive learning, addressing issues like slow response times. Coupling AI with hybrid systems that combine affordable hardware, and advanced software could help bridge accessibility gaps, making inclusive technologies available globally.

In addition to technical challenges, there is a lack of alignment between AAC tools and the linguistic and symbolic needs of non-Western countries, such as Saudi Arabia. Current AAC systems are often designed around Western languages and cultural symbols,

which limits their effectiveness in diverse settings. Researchers and developers could focus on integrating regional languages, such as Arabic, and culturally relevant symbols into AAC systems. AI-driven customization could further enhance these systems by learning user preferences and regional nuances, ensuring adaptability across multilingual contexts. These adaptations could improve accessibility and usability, particularly for students in culturally and linguistically diverse environments.

Globally, this study encourages researchers to explore AAC's cultural aspects and their role in inclusive education, fostering culturally responsive systems. Despite this, experiences of AAC users in inclusive education remain underexplored. Researchers can use these findings to develop programs that address barriers and ease challenges for both students using AAC and their educators. Additionally, this study highlights the importance of integrating AAC courses into university academic programs for teachers, enhancing their training, knowledge, and skills to support inclusive classrooms effectively.

Future Directions

Future research should prioritize transforming AAC systems by addressing their technical, cultural, and emotional dimensions to create holistic improvements for diverse users, such as faster response times, culturally relevant adaptations, and support for emotional well-being. AI technologies have notable potential to improve AAC tools by enabling faster response times, real-time feedback mechanisms, and adaptive features that support active participation in academic and social interactions. However, barriers such as high costs, lack of infrastructure, and limited technical support must be addressed, particularly in resource-limited settings. Solutions such as government-subsidized programs and partnerships with technology companies could help make advanced AAC systems more accessible and equitable for underserved populations. These efforts will ensure that AAC systems empower students with complex communication needs in inclusive educational environments.

Future studies should also investigate how teacher perceptions, classroom accommodations, and professional development initiatives influence AAC

success. Understanding these factors could yield valuable insights for improving inclusive education practices globally. Additionally, the emotional well-being of AAC users must be prioritized, as communication challenges often lead to frustration, isolation, and withdrawal. Interventions such as peer mentorship programs and consistent emotional support from trained staff could help AAC users build confidence and resilience, enabling them to engage more fully in school activities. By addressing these interconnected dimensions, researchers can ensure that AAC systems empower students academically, socially, and emotionally in inclusive educational environments.

Limitations

This study sought to understand the experiences of student who use AAC systems through the perspectives of their parents. However, there are a few limitations that must be acknowledged. First, because the data rely on retrospective accounts, participants were required to recall past experiences, which can sometimes lead to memory distortion or bias (Schacter et al., 2011). This might have influenced the richness and accuracy of the information shared, as emotionally charged or significant events tend to be recalled more vividly (Maxwell, 2013). Second, the data are based entirely on parental reports. While these provide valuable insights, they may not fully reflect the students' daily experiences with AAC systems, as parents' perspectives can be influenced by their own emotions or perceptions (Dempsey et al., 2016). Additionally, as is typical in qualitative research, the results are not meant to be generalized beyond the study participants. The findings are specific to this group of parents and students and may not be applicable to other AAC users or educational contexts (Creswell & Poth, 2023). Recognizing these limitations allows for a more careful interpretation of the study's findings.

Conclusion

Parents reported that AAC systems supported their children's participation in academic and social activities. However,

the limitations of low-tech AAC systems and the absence of culturally appropriate options hindered complex communication. These challenges negatively impacted students' educational progress, social integration, and emotional well-being. To address these issues, schools should implement more advanced, culturally appropriate AAC systems to better support students' communication needs. Consistent, standardized, and specialized teacher training is also essential to ensure comprehensive support for AAC users in academic and social contexts.

Acknowledgements

The author expresses gratitude to the participants for their time and contributions.

Disclosure statement

The author declares no conflicts of interest related to the research, authorship, or publication of this article.

Funding

No funding was received for this study.

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