

Teachers' Awareness and Implementation of Augmentative and Alternative Communication for Teaching Autistic Children in Kampala, Uganda

Nalule Aisha¹ Nur Sakinah Ahmad Nasaruddin^{2*}

^{1,2}*Department of Curriculum and Instruction,
Kulliyyah of Education,
International Islamic University Malaysia,
Gombak, Malaysia*

**Corresponding Author: nur_sakinah@iium.edu.my*

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Abstract

This study investigates teachers' awareness and implementation of Augmentative and Alternative Communication (AAC) for teaching children with autism in Kampala, Uganda, where limited awareness and effective use of AAC persist despite its proven benefits. AAC plays a crucial role in supporting or replacing speech for individuals with complex communication needs. Guided by Rogers' stages of the innovation-decision process, with a focus on the knowledge (awareness) and implementation stages, the study employed a quantitative approach using a descriptive cross-sectional survey design. The target population comprised special needs education teachers who taught autistic children and incorporated AAC into their teaching. A sample of 101 respondents was selected through snowball sampling across five divisions of Kampala District. Data were analysed using the Statistical Package for the Social Sciences (SPSS), employing descriptive statistics and Pearson correlation analysis. The findings revealed that teachers in Kampala have low to moderate levels of awareness of AAC in teaching autistic children. Despite this, teachers actively implemented AAC strategies, indicating that implementation can occur even when awareness is limited. The study found a significant, moderate to strong positive correlation between teachers' awareness and their implementation of AAC ($r = .645$), suggesting that higher levels of awareness are associated with greater implementation of AAC strategies. These findings highlight the need for targeted professional development to strengthen teachers' knowledge and support more effective use of AAC.

Keywords: *Augmentative and alternative communication, autistic children; teachers' awareness, special needs assistive technology, Rogers' stages of innovation-decision.*

INTRODUCTION

Children with special needs require individualized support tailored to their specific needs and have been categorized into three broad types: physically disabled children, mentally disadvantaged children, and socially maladjusted children (Khushaboo & Dua, 2022). Autism Spectrum Disorder (ASD) falls under the socially maladjusted category and is typically diagnosed before the age of three. It is characterized by difficulties in social interaction, communication, adapting to changes, and repetitive behaviors (World Health Organization, 2023). Although symptoms vary from one child to another, communication and social interaction are affected across all forms of the condition (Salari et al., 2022). These communication challenges include difficulties with joint attention and delayed semantic development, which affect children's understanding of words, pictures, and sentences (Syriopoulou-Delli & Eleni, 2022).

Augmentative and Alternative Communication (AAC) is widely used to support or replace speech for individuals with complex communication needs like these. AAC spans no-tech, low-tech, and high-tech systems, ranging from gestures and sign language to picture exchange systems (PECS) and speech-generating devices (SGDs) using tablets and specialized apps (Elsahar et al., 2019; Lorah et al., 2013; Froli et al., 2022), and consistent AAC use has been shown to improve communication skills in children with ASD (Pansegrouw & Boda, 2015). More broadly, teachers have increasingly turned to technology to enhance learning for autistic children, since it can bridge gaps by providing resources and experiences that conventional teaching methods may not offer, creating more opportunities for children to learn quickly and improving learning outcomes (Arslan et al., 2022).

Despite this potential, the effective implementation of AAC faces several obstacles. Teacher competency is a central one. A web-based survey of 1,198 special education teachers in the United States found that most had received no formal training in AAC, leaving them with minimal knowledge and skills to use it effectively (Da Fonte et al., 2022). Without proper knowledge and skills, efforts to implement AAC will likely fail to meaningfully support autistic children's communication or behavior. Resource availability compounds this problem in developing countries. Uganda, for instance, lacks the AAC resources more readily available in countries like the United States, and research on AAC in developing-country contexts remains limited despite its demonstrated benefits for individuals with communication difficulties (Farzana et al., 2020).

Taken together, awareness, training, and resource gaps continue to limit AAC adoption despite its proven effectiveness in supporting communication among autistic children. Hence, this study addresses these gaps by investigating teachers' awareness and use of AAC in teaching children with autism in Kampala, Uganda, with the aim of informing more effective communication strategies to support inclusive education.

RESEARCH OBJECTIVES AND QUESTIONS

This study aims to determine the level of awareness of augmentative and alternative communication (AAC) among teachers working with autistic children in Kampala, Uganda, and to examine the strategies these teachers use to implement AAC in supporting the learning and communication needs of these children. To address these aims, the study was guided by the following research questions:

- 1) What is the level of awareness of AAC among teachers working with autistic children in Kampala, Uganda?
- 2) What strategies do teachers use to implement AAC when teaching autistic children in Kampala, Uganda?

- 3) Is there a significant relationship between teachers' awareness of AAC and their AAC implementation strategies?

LITERATURE REVIEW

The Use of AAC in Uganda

Studies in Uganda highlight limited use of structured communication methods, such as AAC, among children with autism. Kimera (2022) found that many children relied on inappropriate facial expressions due to limited access to functional communication tools, emphasizing the need for teachers to adopt suitable AAC strategies such as the Picture Exchange Communication System (PECS), Speech Generating Devices (SGDs). Similarly, the UNICEF Uganda ARSS Mapping Study (2025) revealed low community awareness of developmental disabilities, with a focus on physical impairments, leading to misunderstanding and stigma around autism and delayed intervention.

Teachers also face challenges in supporting autistic children due to a lack of AAC resources such as the Picture Exchange Communication System (PECS) which uses picture symbols to help non-verbal learners communicate their needs and ideas, limiting their ability to provide quality education (Kabunga et al., 2025). Unlike developed countries, Uganda has fewer resources and limited research on AAC implementation, despite its proven benefits (Farzana et al., 2020). This study therefore seeks to address the gap in understanding teachers' awareness and use of AAC, informing policy, teacher training, and resource allocation to improve communication support and educational outcomes for children with ASD in Uganda.

Benefits of Augmentative and Alternative Communication (AAC)

AAC is particularly beneficial for autistic children who have not developed verbal skills, serving as either a replacement or a supplement to existing communication abilities (Iacono et al., 2016). It includes methods such as manual signs, picture exchange systems, boards, and speech-generating devices, offering adaptable tools to enhance meaningful communication and overall quality of life. AAC also supports social interaction and daily routines, allowing children to request or reject items, interact with peers, and comment vocally (Aftab et al., 2023).

Parents of autistic children report positive experiences with AAC, noting reduced frustration, improved conversation, and enhanced interaction through multimodal communicators that integrate multiple AAC tools (Laubscher et al., 2024). However, challenges remain, including limited access to support, service-delivery models, and individualized interventions, highlighting a gap between the availability of AAC tools and the infrastructure needed for effective implementation (Berenguer et al., 2022).

Teachers' Awareness of AAC

Effective implementation of AAC requires that teachers understand how these interventions function to support learners with communication needs. Without adequate knowledge, teachers may struggle to deliver personalized instruction and tailor AAC strategies to the strengths of autistic children (Sibanda & Mhlanga, 2024). Teachers' skills and understanding are essential, as selecting appropriate AAC tools often requires careful observation of students to meet their diverse needs (Aldabas, 2019). Research shows that teachers' attitudes toward autistic children are influenced by awareness and training, which supports effective classroom management and equitable education (Ekom-Idorenyin, 2020; Gomez-Mari, 2021). However, studies also reveal gaps in knowledge. For example, some teachers are unfamiliar with AAC definitions and its types, such as aided and unaided AAC, though they may use tools like picture cards to support communication (Razak et al., 2022).

A recent literature search shows no direct evidence of Ugandan teachers' awareness of AAC. In other words, no studies have directly investigated Ugandan teachers' awareness of this assistive

technology for autistic children, highlighting a significant gap in the literature on this topic. Almost 20 empirical papers retrieved from Consensus.app (an AI-powered search engine) report data from countries such as Saudi Arabia, the United States, Malaysia, South Africa, Australia, Italy, and Belgium, but none sampled Ugandan or broader East African classrooms. The closest regional evidence comes from South Africa, where studies consistently find limited teacher knowledge and inadequate preparation for AAC implementation. South African special school teachers report feeling ill-equipped to support learners who rely on AAC due to limited resources and inadequate training (Sibanda & Mhlanga, 2024). Although AAC is recognized in South African education policy, many teachers still have limited knowledge of it (Ngcobo & Bornman, 2024). Rural South African teachers likewise highlight the need for intensive, continuous professional development in AAC device use (Mudau & Nzima, 2023).

Beyond South Africa, findings elsewhere follow the same pattern of low or limited AAC awareness, with one notable exception. Preservice special education teachers in Saudi Arabia showed very low AAC knowledge, with only 2.66% of responses fully accurate—indicating a major training deficit (Subihi, 2013). According to Joginder Singh et al. (2020), most Malaysian teachers in their study had limited knowledge of AAC that led them to experience difficulties supporting their students. A separate needs-analysis survey of 73 Malaysian special education teachers found an average level of AAC knowledge and skills, emphasizing the need for more extensive guidance (Yasin et al., 2020). The exception is Kerala, India, where Jacob and Gupta (2023) found moderate to high awareness: 93.3% of surveyed special educators reported knowing about AAC, and more than 83% had used it with patients. Taken together, the limited evidence available shows that teachers and special educators generally report low to moderate knowledge and awareness of AAC—with Kerala standing out as the sole exception to this pattern.

Teachers' Use and Implementation of AAC

The Individuals with Disabilities Education Act (IDEA, 2004) ensures that children with disabilities, including autism, have the right to a free and appropriate education, which includes access to AAC services. Teachers are responsible for selecting and implementing appropriate AAC interventions based on assessments, observation, and collaboration with speech-language pathologists, while planning for contingencies if services are unavailable (Anwar & Barnett, 2024). Research shows that teachers use a variety of AAC tools, including high-tech devices such as iPads, smartboards, and apps, as well as low-tech tools like picture cards, gestures, and manual sign language, to support learners with complex communication needs (Sulaimani, 2017; Mudau & Nzima, 2023). Devices like Go Talk, incorporating peer voice recordings, have been used to help nonverbal learners make requests. However, challenges such as high costs, limited access, rapid technological changes, and inconsistent parental support can hinder effective AAC implementation (Norrie et al., 2021; Ndunguru & Kisanga, 2023).

Although teachers can use a wide range of AAC tools and strategies, a lack of structured training programs prevents them from implementing these effectively (Maebana, 2025). This, coupled with the lack of advanced technologies, forces teachers to rely on gestures and picture-based communication. Evidence also points to contextual adaptation in how teachers apply AAC. For instance, in a study involving virtual schooling, teachers implement aided AAC modeling by ensuring device access, promoting attention through gestural and verbal prompts, modeling symbols, confirming responses, and using visual supports, with caregiver collaboration proving essential (Wei & Bhattacharya, 2023). In South African special schools, teachers rely on pictures and teamwork to operate devices such as the Go Talk 20 (Mudau & Nzima, 2023), while in Indonesia, teachers adopt the Picture Exchange Communication System (PECS) following targeted training, underscoring the role of professional development in strategy adoption (Ludfi et al., 2024). Across these varied contexts, teachers consistently demonstrate resourcefulness and creativity, adapting whatever tools, training, and support are available to them into workable communication strategies for their students.

Relationship Between Awareness and Implementation

The successful implementation of Augmentative and Alternative Communication (AAC) relies heavily on teachers' awareness, which can be enhanced through continuous professional development, training programs, and workshops that equip teachers with the knowledge and skills necessary to adopt AAC effectively (Alhuzimi, 2026; Kammet et al., 2024). However, evidence suggests that many special education teachers do not receive adequate AAC training, leaving them with limited knowledge and skills to support its implementation (Loi et al., 2023; Thompson, 2022). This gap is echoed elsewhere: teachers have reported feeling ill-equipped to use AAC due to limited knowledge and support, which in turn hinders its proper integration into classrooms (Tonsing & Dada, 2016; Sibanda & Mhlanga, 2024).

This link between knowledge and effective practice is also evident at the level of professional service delivery. Flores and Dada (2025) found that AAC service delivery is closely tied to professionals' knowledge and competence in the field—adequate knowledge enables informed decision-making and appropriate support, while limited knowledge can hinder implementation. Similarly, teachers who report limited familiarity with low- and high-tech AAC strategies may be less able to support learners who rely on AAC (Wu et al., 2026).

Beyond the AAC literature specifically, research across multiple disciplines—including healthcare, education, agriculture, and environmental management—consistently points to a positive association between awareness and implementation, although awareness alone is rarely sufficient to sustain it. Klonyut and Jantori (2024), for instance, found a moderate positive correlation (.500, $p < .01$) between environmental awareness and accounting practice, showing that firms with greater awareness of environmental disclosures were more likely to adopt appropriate practices. Cruz et al. (2020) similarly found that greater awareness of published research was associated with greater influence and more frequent implementation of that research, though no correlation value was reported, making the strength of this association difficult to estimate.

Not all evidence points in the same direction, however. McSherry et al. (2006) found that awareness does not always translate into practice: in their study of research awareness among registered health care professionals, 91% of respondents agreed that evidence-based practice plays a large part in improving patient care, yet only 30% had actually instigated a change in their own practice. Studies examining the specific association between teachers' awareness of AAC and their implementation of it are almost nonexistent. Whether a similar gap between awareness and implementation, found in the proxy studies reviewed, will emerge in the present work remains to be seen.

THEORETICAL FRAMEWORK

Roger's Stages of Innovation-Decision Process

This study adopts Rogers' Stages of the Innovation-Decision Process to explain how technological ideas, techniques, or practices—such as augmentative and alternative communication (AAC)—are introduced, spread, and adopted within a social system (e.g., teachers in Uganda teaching autistic children). According to the theory of diffusion of innovations, individuals move through a process that begins with awareness of an innovation and progresses to forming an attitude toward it, deciding whether to adopt or reject it, implementing it, and finally confirming its continued use (Rogers, 2003). The five stages of this process—knowledge, persuasion, decision, implementation, and confirmation

(K-P-D-I-C)—provide a framework for understanding how teachers must first become aware of AAC, develop opinions about it, and then decide whether to integrate it into their teaching practices.

Knowledge

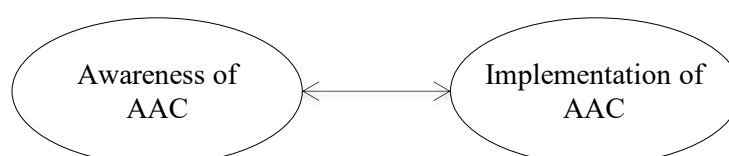
The Knowledge stage is where an individual first becomes cognitively engaged with an innovation, seeking to answer "What?", "How?", and "Why?" Rogers (2003) divides this stage into three sub-types. *Awareness-knowledge* is simply knowing that the innovation exists, without yet understanding how it works or what it does in detail. This is the type of knowledge that motivates an individual to seek further information and move toward adoption (Frei-Landau et al., 2022). *How-to-knowledge* is knowing how to use the innovation correctly and represents a higher level of engagement than mere awareness. *Principles knowledge* is the deepest level, entailing an understanding of the underlying functioning principles of why the innovation works.

Implementation

Implementation is the fourth stage in Rogers' model, occurring after Knowledge, Persuasion, and Decision. It is the stage at which an individual puts the innovation into actual use (Oyarzun et al., 2021): behavioral change occurs as the potential adopter moves from purely cognitive engagement with the idea to active practice—actually using and testing it. Rogers emphasizes that implementation can involve *reinvention*, where users modify or adapt the innovation to fit their own context rather than adopting it exactly as designed by the innovator. Integrating implementation ensures that innovations are not only adopted but also effectively applied; in the case of AAC, researchers can draw on readily available tools and existing frameworks to support individuals with communication difficulties (Binger et al., 2022).

Rogers' theory has found wide application in educational research, offering valuable insight into the adoption and diffusion of innovations (Chen, 2024), which underscores its relevance to this study of Ugandan teachers' awareness and use of AAC for teaching children with autism. Of the five K-P-D-I-C stages, this study examines only two—awareness and implementation—since teachers' knowledge about AAC is vital to its successful use in the classroom (Almethen, 2023). By focusing on these two constructs, the study investigates whether a relationship exists between teachers' awareness of AAC and their implementation of it. The hypothesized relationship is illustrated in Figure 1:

Figure 1
Relationship between Teachers' and Awareness of AAC



The double-sided arrow indicates that the two constructs are correlated. Based on the literature review and Rogers' stipulations, the study hypothesizes that:

H₁: Teachers' awareness of AAC is positively correlated with their implementation of AAC.

METHODOLOGY

Research Design

The study was anchored in the positivist paradigm, which holds that social phenomena can be measured objectively and that relationships between variables can be established through empirical, quantifiable data. Guided by this paradigm, the study adopted a quantitative approach and a correlational design to examine the relationship between teachers' awareness and implementation of augmentative and alternative communication (AAC) in teaching autistic children. A cross-sectional survey method was employed, allowing data on both constructs to be collected from participants at a single point in time.

Sample

The study involved approximately 101 special needs teachers teaching children with autism in schools located in Kampala, Uganda, who had direct experience using augmentative and alternative communication (AAC) tools such as Picture Exchange Communication Systems (PECS) and speech-generating devices (SGDs). Snowball sampling, a non-probability technique in which participants recruit other eligible teachers from their professional networks, was used to select respondents (Sharma, 2017). This approach was appropriate due to the difficulty in identifying teachers who specialize in autism and AAC in Uganda, given the limited number of such professionals. Demographic details of the sample are presented in the Results section.

Instrument

A structured 20-item questionnaire, adapted to suit the specific needs of the study, served as the primary data collection tool. The instrument was organized into three sections. Section One captured respondents' demographic information (i.e., age, gender, highest level of education, years of teaching experience, teaching level, school division), and whether the respondent had ever applied AAC tools to support communication for autistic children in their teaching. Sections Two and Three each comprised 10 items measuring the study's two constructs Awareness of AAC and Implementation of AAC, respectively, with the full item lists presented in the Results section (Tables 1 and 2). Items drew on the work of two studies and were refined to suit the specific needs of the study (Yasin et al., 2020; Loi et al., 2023). Items measuring Awareness were adapted from Yasin et al. (2020) and items measuring Implementation were adapted from Loi et al. (2023). Two experts in educational technology and special needs education validated the items; their recommendations were reviewed and incorporated, resulting in a few necessary adjustments to enhance the clarity and relevance of the questionnaire items. Reliability testing yielded Cronbach's alpha coefficients of .90 for the Awareness scale and .91 for the Implementation scale, indicating strong internal consistency for both.

DATA COLLECTION

Approval to collect data was obtained from the Kulliyah of Education, International Islamic University Malaysia (IIUM). Potential participants were then contacted via email, phone calls, and WhatsApp, and a structured questionnaire was shared with them electronically using Google Forms. Participation was voluntary, and respondents were given sufficient time to complete the survey. Follow-up reminders were sent to enhance the response rate. In terms of ethics, the study ensured informed consent and voluntary participation. Effective communication between the researcher and respondent teachers was key in this process (Renn, 2020). The respondents were given a brief explanation of the study's purpose and benefits, and the researcher informed them that they could complete the survey voluntarily. In addressing the issue of confidentiality, the respondent teachers

were assured that their identity and the information they provided would only be used for research and academic purposes and treated and maintained as confidential.

DATA ANALYSIS

Data collected from the questionnaires were coded and entered into the Statistical Package for Social Sciences (SPSS) for analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations) and inferential statistics (Pearson correlation) were used to address the study's research objectives. Mean scores were interpreted using the guidelines of Pimentel (2010) to determine respondents' levels of awareness and implementation of AAC. Values ranging from 1.00 to 1.80 were interpreted as very low, 1.81 to 2.60 as low, 2.61 to 3.40 as moderate, 3.41 to 4.20 as high, and 4.21 to 5.00 as very high. For the correlation analysis, summated scores for awareness and implementation were obtained by summing the responses to the 10 items measuring each construct. The strength of the correlation between the two constructs was interpreted using the guidelines of Evans (1996), wherein a coefficient of .00 to .19 was considered very weak, .20 to .39 weak, .40 to .59 moderate, .60 to .79 strong, and .80 to 1.0 very strong.

RESULTS

Sample Demographics

The study sample comprised 101 teachers working with autistic children in Kampala, Uganda. The sample was predominantly female ($n = 92$, 91.1%), with male teachers comparatively underrepresented ($n = 9$, 8.9%). In terms of age, the largest group of respondents was aged 30–39 ($n = 42$, 41.6%), followed by 40–49 ($n = 29$, 28.7%), 20–29 ($n = 22$, 21.8%), and 50–59 ($n = 8$, 7.9%), with no respondents aged 60 or above. Most participants held a bachelor's degree ($n = 69$, 68.3%), followed by a diploma ($n = 27$, 26.7%) and a master's degree ($n = 5$, 5.0%); none held a doctorate. Regarding teaching experience, the largest proportion had 5–10 years of experience ($n = 46$, 45.5%), followed by less than 5 years ($n = 39$, 28.7%), 11–15 years ($n = 17$, 16.8%), 16–20 years ($n = 7$, 6.9%), and more than 20 years ($n = 2$, 2.0%). Most respondents taught at the kindergarten level (ages 3–5; $n = 83$, 82.2%), with the remainder teaching lower primary (ages 6–9; $n = 18$, 17.8%). Finally, participants were drawn from five school divisions across Kampala, with the largest share from the Central division ($n = 53$, 52.5%), followed by Kawempe ($n = 27$, 26.7%), Lubaga ($n = 8$, 7.9%), Makindye ($n = 7$, 6.9%), and Nakawa ($n = 6$, 5.9%). All teachers (100%) reported having used AAC in some form to support communication with autistic children at school.

Level of AAC Awareness Among Teachers Working with Autistic Children in Kampala, Uganda

Table 1 shows the distribution of responses to the 10 items measuring teachers' awareness of AAC.

Table 1*Ugandan Teachers' Awareness of AAC (N = 101)*

Awareness Items	Response Options			M	SD
	D	N	A		
I am aware of AAC as					
1) a method to help children with autism communicate.	16 (15.8)	20 (19.8)	65 (64.4)	3.62	1.09
2) a supplement to communication, such as gestures and sign language.	14.0 (13.9)	26.0 (25.7)	61.0 (60.4)	3.53	0.96
3) a replacement for communication, such as the picture exchange communication system, speech-generating devices	16.0 (15.8)	36.0 (35.6)	49.0 (48.5)	3.34	0.96
4) a distinct from augmentative and alternative communication.	37.0 (36.6)	31.0 (30.7)	33.0 (32.7)	2.99	1.20
5) can be used without help (unaided) through sign language or gestures.	18.0 (17.9)	30.0 (29.7)	53.0 (52.5)	3.41	0.98
6) can be used with help (aided) through picture exchange communication system and speech-generating devices	13.0 (12.9)	36.0 (35.6)	52.0 (51.5)	3.46	0.91
7) can be adapted to match the individual needs of each autistic child.	5.0 (5.0)	10.9 (9.9)	88.6 (85.1)	3.58	0.87
I am familiar with					
8) the use of picture exchange communication systems.	55.0 (54.4)	13.0 (12.9)	33.0 (32.7)	2.57	1.34
9) the use of speech-generating devices	10.0 (9.9)	33.0 (32.7)	58.0 (57.5)	3.58	0.89
10) I know where to find information about AAC resources for my work	28.0 (27.7)	22.0 (21.8)	51.0 (50.5)	3.31	1.29
Construct Mean				3.34	0.77

Note: D = Disagree; N = Neutral; A = Agree; M = Mean; SD = Standard Deviation

Based on the figures in Table 1, teachers reported fairly consistent low-to-moderate awareness of AAC as a concept (i.e., its purpose, forms, and adaptability). The most highly endorsed item was teachers' agreement that AAC can be adapted to match individual needs (85.1% agreement—the highest agreement rate in the table), followed by awareness of AAC as a method to help autistic children communicate (64.4% agreement; $M = 3.62$, $SD = 1.09$) and familiarity with speech-generating devices (57.5% agreement). Teachers, by contrast, reported comparatively low familiarity with one specific tool—picture exchange communication systems (PECS)—which had the lowest agreement rate among the AAC-related items. This is a notable finding, as PECS is typically one of the main tools used to support communication in autistic children. Lower agreement, again suggesting limited familiarity, was also recorded for the item “I am aware of the distinction between augmentative and alternative communication” (33.0% agreement), indicating that teachers struggled to distinguish this aspect of AAC from other communication approaches. Overall, Ugandan teachers in this sample did not demonstrate a high level of AAC awareness, as reflected in the mean score for the construct ($M = 3.34$, $SD = 0.77$), suggesting that their understanding of AAC and its role in supporting communication among autistic children remained largely basic.

Strategies Teachers Use in Implementing AAC

Table 2 shows the distribution of responses to the 10 items measuring teachers' implementation of AAC in Kampala, Uganda, reporting the frequency, percentage, mean, and standard deviation for each item.

Table 2

Ugandan Teachers' Implementation of AAC (N = 101)

Implementation Strategies	Response Options			M	SD
	D	N	A		
1) Using picture exchange communication systems	7.0 (6.9)	6.0 (5.9)	94.0 (93.0)	4.28	0.67
2) Using speech-generating devices	3.0 (3.0)	22.0 (21.8)	76.0 (73.3)	4.04	0.88
3) Using gestures and sign language	1.0 (1.0)	10.0 (9.9)	90.0 (89.2)	4.32	0.73
4) Teaching autistic children how to use AAC applications and devices effectively.	8.0 (7.9)	20.0 (19.8)	73.0 (72.3)	3.80	0.87
5) Planning individualized lessons using AAC	8.0 (7.9)	28.0 (27.7)	65.0 (64.4)	3.69	0.83
6) Assessing the communication development of autistic children using AAC	4.0 (4.0)	22.0 (21.8)	75.0 (74.2)	3.95	0.83
7) Modifying my teaching materials to support the use of AAC.	3.0 (3.0)	27.0 (26.5)	71.0 (70.3)	3.84	0.77
8) Making sure that AAC tools are available to autistic children when needed	4.0 (4.0)	29.0 (28.7)	68.0 (67.3)	3.83	0.83
9) Collaborating with speech therapists during the implementation of AAC.	4.0 (4.0)	18.0 (17.8)	79.0 (78.3)	4.07	0.85
10) Collaborating with families of autistic children during the implementation of AAC.	3.0 (3.0)	15.0 (14.9)	83.0 (82.2)	4.13	0.81
Construct Mean				3.99	0.61

Note: D = Disagree; N = Neutral; A = Agree; M = Mean; SD = Standard Deviation

Compared to awareness, the use of implementation strategies was reportedly higher among this sample of Ugandan teachers. Teachers reported using AAC-related strategies more confidently than they reported understanding AAC's underlying concepts and specific tools. Large majorities of agreement were recorded across the board, with every item exceeding 64% agreement. The most strongly endorsed strategy was using gestures and sign language (89.2% agree, $M = 4.32$, $SD = 0.73$, which is the lowest SD in the table, indicating high consensus among respondents. Using picture exchange communication systems was similarly high (93.0% agree, $M = 4.28$, $SD = 0.67$), as was collaborating with families during AAC implementation (82.2% agree, $M = 4.13$, $SD = 0.81$). Collaborating with speech therapists during implementation was also strongly endorsed (78.3% agree, $M = 4.07$, $SD = 0.85$).

The comparatively weaker items were teaching autistic children to use AAC applications and devices effectively (72.3% agree, $M = 3.80$, $SD = 0.87$) and planning individualized lessons using AAC (64.4% agree, $M = 3.69$, $SD = 0.83$; this is the lowest mean in the table). This suggests that while

teachers are comfortable using AAC tools directly, more deliberate instructional planning and skill-building with students remains a relatively weak point. Overall, every implementation item averaged above the midpoint of the scale, and most exceeded 3.8, a noticeably higher and more consistent pattern than Table 1's awareness items, which ranged more widely ($M = 2.57$ to $M = 4.17$).

Relationship Between Teachers' Awareness and Implementation of AAC

A Pearson correlation analysis was conducted to examine the relationship between teachers' awareness of AAC (AwareScore) and their implementation of AAC (ImplScore). The results indicate a significant and strong positive correlation between the two variables, $r(99) = .645$, $p < .001$, $n = 101$. This suggests that teachers with higher levels of AAC awareness tended to report higher levels of AAC implementation. The result, therefore, supports the study's hypothesis (H_1) that teachers' awareness is significantly and positively associated with their implementation of AAC.

DISCUSSION

Ugandan Teachers' Awareness of AAC

This study provides evidence that AAC awareness among teachers working with autistic children in Kampala, Uganda ranges from low to moderate. It is, at best, moderate, and this too depends on the specific aspects of AAC being measured. To our knowledge, this is the first study to examine this awareness in the Ugandan context. Our findings are consistent with South African data showing that special-school teachers report limited AAC knowledge despite AAC being embedded in national education policy (Ngcobo & Bornman, 2024). Teachers in other countries have reported similarly limited AAC knowledge; in Malaysia, for instance, most teachers reported limited awareness. India is the only country reporting moderate to high AAC knowledge among teachers (Jacob & Gupta, 2023). Ugandan teachers supporting children with autism in central Uganda face stigma, resource limitations, and emotional strain, with no mention of AAC tools or training in their practice (Kabunga et al., 2025). Given these parallels across sub-Saharan African special education contexts, AAC awareness among Ugandan teachers elsewhere in the country is likely similarly constrained by the same lack of structured training and device access documented regionally (Mudau & Nzima, 2023). Since this study relied on non-probability sampling, further empirical research across other regions of Uganda using rigorous probability sampling methods is needed to confirm this inference.

The descriptive findings on teachers' awareness of AAC are consistent with the analysis done in previous studies. Razak et al. (2022) discussed AAC: The Need for Teacher Guidelines. It was reported that most teachers have applied AAC to their students but are not aware of the correct procedure and approach to implementation. This aligns with the research's findings, where teachers demonstrate a moderate level of awareness regarding where to find information about AAC resources for their work. With limited research and knowledge about AAC, teachers have a limited understanding of its effective implementation. Additionally, another study found that most special education teachers did not receive formal training in AAC during their teacher preparation programs, resulting in low levels of self-reported knowledge and skills (Da Fonte et al., 2022). Therefore, these findings underscore the importance of teacher training, supported by guidelines, as well as ongoing professional development, to ensure the effective and consistent use of AAC in educational settings.

Ugandan Teachers' Implementation of AAC

Overall, teachers in Kampala, Uganda actively use AAC strategies to support communication in autistic children. They tend to favor low-tech tools and often work collaboratively with others to make these strategies more effective. This supports earlier research showing that tools like PECS can meaningfully improve how well learners communicate (Abonoa et al., 2023; Lutfianti et al., 2023).

Gestures and sign language (89.2%) were endorsed as the single most-used strategy. The finding is consistent with the literature's broader pattern of teachers' low-tech reliance in under-resourced settings. It corroborates Maebana's (2025) statement that a lack of structured training programs, combined with limited access to advanced technologies, often forces teachers to fall back on gestures and picture-based communication rather than more sophisticated AAC tools. This is a pattern that closely mirrors the Ugandan teachers in this sample, for whom gestures and PECS (93.0%) were used more heavily than higher-tech options such as speech-generating devices (73.3%). This also aligns with findings from South African special schools, where teachers similarly relied on pictures and teamwork to operate available devices such as the Go Talk 20 (Mudau & Nzima, 2023), and with Indonesian classrooms, where PECS adoption followed targeted training rather than reliance on costlier technology (Ludfi et al., 2024).

The prevalence of collaboration in the present findings—both with families (82.2%) and with speech therapists (78.3%)—also echoes the literature's emphasis on teamwork as a compensatory strategy where formal AAC infrastructure is limited. Wei and Bhattacharya (2023) similarly found that caregiver collaboration was essential to effective aided AAC modeling, even in a virtual schooling context far removed from Uganda's classrooms, suggesting that collaborative implementation may be a fairly universal adaptation teachers make when institutional support and technology are constrained.

At the same time, the comparatively weaker findings for teaching students to use AAC devices effectively (72.3%) and for planning individualized AAC-based lessons (64.4%) point to a specific gap consistent with Norrie et al. (2021) and Ndunguru and Kisanga (2023), who identified high costs, limited access, and inconsistent parental support as persistent barriers to more sustained, planned AAC implementation. Collectively, these results suggest that Ugandan teachers, like their counterparts in other under-resourced settings, demonstrate laudable resourcefulness in adapting available tools and relationships into workable communication strategies, even as the literature's identified barriers—limited training, cost, and technology access—continue to constrain the more deliberate, instructional dimensions of AAC use.

Relationship Between Teachers' Awareness and Implementation of AAC

The finding of a significant, strong positive correlation between awareness and implementation ($r(99) = .645, p < .001$) answers the question raised earlier in this paper: unlike McSherry et al. (2006), who found that awareness did not reliably translate into practice among health care professionals, the Ugandan teachers in this sample showed the opposite pattern. Teachers who reported greater AAC awareness also reported greater AAC implementation, and the relationship was not just present but strong. This supports Rogers' Innovation Decision Process, which holds that knowledge is a prerequisite for the adoption and implementation of an innovation—here, awareness functioned much as the model would predict, as a foundation that carried through into practice.

This result also goes beyond what much of the cross-disciplinary literature was able to show. Klonyut and Jantori (2024) found a moderate positive correlation ($r = .500$) between environmental awareness and accounting practice, and Cruz et al. (2020) found a similar association between research awareness and implementation without reporting a correlation value at all. The relationship found here ($r = .645$) is notably stronger than either of these, suggesting that for Ugandan teachers, awareness of AAC may be an even more central driver of implementation than awareness has been shown to be in other fields.

The finding is also consistent with the AAC-specific literature reviewed earlier, which linked teachers' knowledge and training directly to their ability to implement AAC effectively. Alhuzimi (2026) and Kammet et al. (2024) found that teachers who receive training and professional

development acquire the knowledge and skills necessary to implement AAC well, while teachers who lacked adequate training reported feeling ill-equipped and were less able to implement AAC meaningfully (Loi et al., 2023; Sibanda & Mhlanga, 2024; Thompson, 2022). The present findings extend this pattern by quantifying the strength of that relationship for the first time in a Ugandan context and by showing that it holds even where implementation itself—as seen in the previous section—often takes the form of resourceful, low-tech adaptation rather than reliance on advanced AAC technology.

CONCLUSION

The purpose of this study was to examine teachers' awareness and implementation of AAC and the relationship between the two variables among teachers teaching autistic children in Kampala, Uganda, guided by Rogers' Innovation Decision Process. Specifically, the study focused on two stages of the innovation decision process: awareness (knowledge) and implementation, analyzing the level of AAC awareness among teachers and the AAC strategies they use when teaching autistic children in Kampala, Uganda. This study was situated within the broader context of the global transition toward digital learning and increased technology integration in education, which has also influenced special needs education through the adoption of technology tools and aids to enhance the effectiveness of teaching and learning. With the prevalence of autism increasing worldwide, including in Uganda, understanding teachers' knowledge and implementation of AAC is critical for supporting the communication development of autistic learners.

The findings indicated that teachers have a low to moderate level of awareness of AAC but demonstrate strong agreement on the implementation of AAC strategies to support the communication development of autistic children. Teachers recognized the benefits of AAC and applied methods such as PECS, SGDs, gestures, and sign language while teaching autistic children to enhance their communication skills. However, teachers reported being less familiar with the use of SGDs compared with other AAC strategies. This suggests a greater reliance on low-tech AAC rather than high-tech AAC, possibly because low-tech options are more accessible, easier to use, and simpler to maintain. Furthermore, the study found a significant moderate-to-strong positive correlation between teachers' awareness of AAC and their implementation strategies, indicating that higher levels of awareness are associated with greater implementation of AAC strategies.

However, the study revealed notable gaps in knowledge. Teachers showed limited proficiency in distinguishing between augmentative and alternative communication, indicating uncertainty in applying AAC effectively. This suggests a need for focused training and professional development to build foundational understanding, enhance practical skills, and ensure that teachers can implement AAC strategies accurately and confidently to support autistic learners.

LIMITATIONS

The study has certain drawbacks. First, the scope of the study was limited to teachers teaching autistic children in Kampala, Uganda. Kampala district comprises five regions: Central, Kawempe, Lubaga, Makindye, and Nakawa. The findings may not be fully generalizable to teachers working in rural or less-resourced regions; therefore, future studies can broaden the sample to include multiple areas, creating a more diverse sample. Methodologically, the survey used for data collection relies on self-reported responses, which may lead to response bias. Additionally, the use of snowball sampling may limit the representativeness of the sample, as participants are likely to recruit respondents with similar views, thereby restricting the generalizability of the findings.

RECOMMENDATIONS

While the present study focused on the knowledge and implementation stages of Rogers' Innovation Decision Process, future studies should consider examining all five stages: knowledge, persuasion, decision, implementation, and confirmation, to provide a more comprehensive understanding of teachers' adoption of AAC. Incorporating the persuasion stage would allow researchers to explore teachers' attitudes, perceptions, and motivations toward AAC. Examining the decision and confirmation stages would help assess whether teachers choose to adopt AAC, continue using it over time, or modify or discontinue its use based on their experiences. Such an approach would enable a more complete assessment of the AAC adoption process and support the development of more targeted and effective interventions.

Given that this study relied on self-reported survey data, future research should consider qualitative or mixed-methods designs—incorporating classroom observations, interviews, or focus group discussions—to deepen understanding of how AAC strategies are implemented in practice and to reduce the influence of response bias. Future studies should also use probability sampling to improve the accuracy and generalizability of findings to the broader population.

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