

Using Assistive Technology to Support Children with Autism Spectrum Disorder in the Colombo District, Sri Lanka

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Abstract

This study examined the use of Assistive Technologies (AT) by teachers to support children with Autism Spectrum Disorder (ASD) in Sri Lanka, with focus on the types of AT in use, teacher perceptions, implementation challenges, and strategies for effective integration. A mixed-methods approach was implemented, incorporating quantitative data from an online survey of 50 teachers and qualitative insights from semi-structured interviews with 5 teachers and 5 principals from government and private schools in the Western Province. Findings uncovered that various AT tools, including videos, pictures, and communication boards, are used to support learning, communication, and social interaction. However, usage differs significantly, with many teachers lacking familiarity and confidence in employing AT effectively. Challenges identified included insufficient training, limited resources, inadequate institutional support, and resistance from stakeholders, such as school authorities and parents, favouring traditional teaching methods. With these barriers, teachers admitted the potential benefits of AT in enhancing educational outcomes for children with ASD. To address these challenges, the study recommended targeted professional development programmes, awareness campaigns to foster stakeholder engagement, and the establishment of supportive policies with proper resource allocation. This research highlights the need for collaboration among educators, policymakers, and stakeholders to create a conducive environment for AT integration. Such efforts aim to enhance AT usage in the classroom, promote inclusive education, and improve learning outcomes for children with ASD in Sri Lanka.

Keywords: Assistive Technology, Autism Spectrum Disorder, Inclusive Education, teacher perceptions,

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(Received 28 September 2024; Revised 24 July 2025; Accepted 25 July 2025; Published 06 August 2025)
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Introduction

Special Needs Education provides tailored support for children with learning, developmental, and behavioural challenges, including intellectual disabilities, sensory impairments, and developmental disorders like Autism Spectrum Disorder (ASD). With a global prevalence of 1 in 100 (World Health Organization, 2023) and 1 in 93 in Sri Lanka (Perera et al., 2009), ASD demands specialised strategies, interventions, and tools to enhance learning and social interaction (Lord et al., 2018).

ASD is a neurodevelopmental condition characterised by impairments in social communication, restricted interests, and repetitive behaviours. Its severity and presentation vary, making it complex to diagnose and manage (American Psychiatric Association, 2013). These characteristics, particularly in school-aged children, can significantly affect participation in classroom activities, highlighting the need for tailored support such as Assistive Technology (AT). Due to its rising prevalence, research increasingly focuses on effective interventions to improve quality of life of people with ASD (Wong et al., 2015). Early detection and intervention are crucial for long-term success.

AT includes a range of tools designed to support individuals with disabilities by enhancing their functional capabilities. For children with ASD, AT serves as a bridge between communication and learning, helping to address the core impairments associated with the condition (Technology-Related Assistance for Individuals with Disabilities Act, 1988). This act was legislated in the United States to promote access to ATs for individuals with disabilities, ensuring they can participate fully in education, employment, and daily life. Although this Act is not directly applicable in Sri Lanka, foundational principles, equitable access, inclusive

education, and cross-sector collaboration can inform policy development. Drawing on this framework can help Sri Lankan stakeholders understand the importance of organising AT support across educational settings.

In Sri Lanka, the use of AT for children with ASD is limited, despite its potential to significantly improve educational outcomes (Barrett & Marshall, 2012; Muttiah et al., 2016). ICT-based tools, such as educational software and communication devices, have proven beneficial for improving reading, language, organisational skills, and information processing in children with ASD (Flanagan et al., 2013).

The variability of ASD demonstrates not all AT tools are suitable for every child, necessitating careful evaluation and continuous adaptation to meet individual needs (Doobay et al., 2014). Collaboration among teachers, parents, and behaviour experts is crucial to determine the best mix of technology for each child. Tools such as tablets and smartphones are particularly adaptable and effective, underscoring the importance of family involvement in implementing these technologies (Ghanouni et al., 2019).

Exploring teachers' experiences with AT is essential, as they provide valuable insights into the effectiveness of various tools and the challenges faced in educational settings. Understanding these perspectives can inform more effective AT integration, ultimately enhancing the educational experiences and quality of life for children with ASD (Syriopoulou-Delli & Gkiolnta, 2020).

Statement of the Problem

Children with ASD in Sri Lankan classrooms face significant challenges in communication, social interaction, and learning, which hinder their academic success (Rajapakse, 2024; Senarath, 2019). Despite recommended interventions and accommodations, there is a disconnect between clinical suggestions and their implementation in schools, leaving children without the necessary support (Lord et al., 2018). This gap often arises from a lack of awareness among educators about the specific needs and strengths of each child with ASD. Teachers frequently adopt a generalised approach that does not account for individual differences, and the absence of targeted training results in the underutilization of AT tailored to ASD (Wong et al., 2015).

Moreover, teachers face difficulties in selecting appropriate AT tools due to a broad categorization of “disability” without a specific focus on ASD (Flanagan et al., 2013). For instance, while some AT tools such as hearing aids may be effective for other disabilities, they are not relevant for ASD, which requires tools specifically designed to address social communication and behavioural challenges (Ghanouni et al., 2019). This study highlights the urgent need for comprehensive training and collaboration between teachers, healthcare professionals, and behaviour experts to enhance the effective use of AT, ultimately improving educational outcomes for children with ASD.

Rationale

Children with Autism Spectrum Disorder (ASD) often face significant challenges in communication, social interaction, and behaviour, which can hinder their participation in

inclusive education. Key characteristics of children with ASD include difficulties in understanding and using verbal and nonverbal communication, sensory sensitivities, and a preference for routine and predictability. These unique needs demand tailored strategies and tools to ensure effective learning and engagement in inclusive classrooms (American Psychiatric Association, 2013).

AT plays an important role in addressing these challenges by providing alternative means of communication, fostering social interaction, and supporting sensory regulation. For example, speech-generating devices and picture exchange systems enable non-verbal children to express their needs, while visual schedules and sensory tools help them adapt to classroom routines. Despite the proven benefits of AT, its integration into classrooms in Sri Lanka remains limited due to barriers such as lack of awareness, training, and resources among teachers.

With the growing emphasis on inclusive education, it is essential to explore how AT can bridge the gap between the diverse needs of children with ASD and the demands of the mainstream curriculum. Understanding teachers' awareness, knowledge, and experiences with AT is critical for identifying gaps in current practices and developing effective strategies for its implementation (Syriopoulou-Delli & Gkiolnta, 2020). This study aims to address these gaps and provide actionable recommendations to improve AT integration in educational settings, ultimately enhancing support for children with ASD in Sri Lanka.

Aim and Objectives

Overall Aim

The study aimed to explore teachers' awareness and knowledge of ATs for children with ASD in Sri Lanka. With the growing emphasis on inclusive education and the integration of AT, understanding teachers' perspectives and challenges is critical (Syriopoulou-Delli & Gkiolnta, 2020).

Specific Objectives

1. To identify Assistive Technologies (AT) used by teachers to support children with Autism Spectrum Disorder (ASD) in Sri Lanka.
2. To explore teachers' perceptions of the effective use of AT to support children with ASD.
3. To examine the challenges faced by teachers when using AT with children with ASD.
4. To propose suggestions for effectively implementing AT in classrooms for children with ASD in Sri Lanka.

Significance of the Study

This study addresses the gap in understanding teachers' experiences and perspectives on using AT specifically for children with ASD, as most research broadly covers "disability" without focusing on unique needs of ASD (Doobay et al., 2014). Not all types of AT are suitable for children with ASD; for example, speech-generating devices designed for severe speech impairments may not be relevant for children who can speak but struggle with social communication (Technology-Related Assistance for Individuals with Disabilities Act, 1988). Therefore, it is crucial to carefully evaluate and regularly re-evaluate the appropriateness of AT tools, as what works for one child might not necessarily work for another.

The findings of this study provide valuable insights into how AT tools influence the development of children with ASD in the Sri Lankan context. This research further highlights the importance of regularly evaluating the appropriateness of AT tools, a practice supported by existing literature (Lee et al., 2008). For educators, the study underscores the need for deep knowledge of AT and its application to different learning and communication challenges specific to ASD. The study's results are expected to inform the development of targeted teacher training programmes, improved resource allocation, and supportive policies that foster inclusive educational environments in Sri Lanka.

Additionally, the study's impact extends to the broader community, including Sri Lanka, by promoting awareness of AT's role in education and reducing stigma associated with ASD. The research encourages collaboration among educators, parents, and specialists, fostering a supportive structure that enhances social integration, educational outcomes, and independence for children with ASD. By emphasising a community-driven approach, the study aims to create a more empathetic, inclusive society that values the diverse needs of individuals with ASD.

Literature Review

Overview of Supporting Children with ASD

Autism Spectrum Disorder is a complex developmental condition characterised by challenges in social communication, restricted interests, repetitive behaviours, and difficulties with imagination and constructive skills, which can impact learning (American Psychiatric

Association, 2013). ASD can be diagnosed as early as 18 months, but timely diagnosis is crucial to ensuring that children receive the appropriate interventions (Centre for Disease Control and Prevention, 2022). Several cognitive theories, including the Executive Function Theory and Central Coherence Theory, attempt to explain the onset and nature of ASD, emphasizing the cognitive and behavioural differences in individuals with ASD (Booth & Happé, 2010). Additionally, other theories, such as the Theory of Mind, Intense World Theory, Extreme Male Brain Theory, and Multiple Hits Theory, offer diverse perspectives on the sensory sensitivities, social challenges, and genetic-environmental interplay in ASD (Happé & Frith, 2006).

Assistive Technology for Children with ASD

AT encompasses devices and systems that support individuals with disabilities by enhancing their functional capabilities. AT has evolved significantly over the past two decades, driven by the need to empower individuals with disabilities to live more independent lives (Smith et al., 2018; Scherer, 1996). AT includes a wide range of tools, from simple devices to complex technologies, that facilitate learning, communication, and daily functioning for people with disabilities, including those with ASD (Bryant et al., 2012; Crowe et al., 2022). For children with ASD, AT provides a systematic approach to learning and can reduce restricted and repetitive behaviours, improve communication, and enhance social interaction (Mechling, 2007; Hess et al., 2008; Shane et al., 2012).

ATs are categorised as high-tech, mid-tech, and low-tech. High-tech AT includes tools like tablets and speech-generating devices, mid-tech involves adapted keyboards or audio recorders, and low-tech includes visual aids and picture cards (Light & McNaughton, 2014; Muttiah et al., 2018). High-tech AT supports advanced communication, while mid- and low-

tech are cost-effective and practical for resource-limited classrooms (Syriopoulou-Delli & Gkiolnta, 2020). This study explores how teachers and principals use these AT categories in inclusive classrooms, addressing challenges and opportunities.

Examples of AT devices used by children with ASD include text-to-speech software, speech recognition software, and other communication apps that support learning and promote independence (Light & McNaughton, 2014). These technologies are adaptable, allowing educators to customise interventions based on individual needs, fostering inclusion, and enhancing the quality of life for children with ASD.

Importance of AT for Children with ASD

AT is crucial for children with ASD as it addresses core challenges such as communication deficits and restricted behaviours. For instance, speech-generating devices and picture exchange systems facilitate alternative communication, helping children express themselves and engage socially (Hodkinson, 2011; Ganz et al., 2012). AT also supports learning by providing tailored educational experiences that align with each child's strengths and challenges, promoting academic achievement and a sense of accomplishment (Stewart, 2024). Furthermore, AT can enhance emotional regulation and self-control, providing tools that help children manage sensory sensitivities and repetitive behaviours (Baker et al., 2010; Lang et al., 2012).

Role of Teachers in Using AT for Children with ASD

Teachers play a critical role in the successful implementation of AT in educational settings. However, research indicates that many educators lack sufficient knowledge and skills to effectively use AT for children with ASD (Alsolami, 2022; Alanazi, 2020). Enhancing teachers' understanding of AT functionalities and the ability to customise interventions is essential for maximising the benefits of these technologies. Training programmes that focus on expanding teachers' awareness of AT options, tailoring tools to individual student needs, and integrating AT into classroom routines can significantly improve educational outcomes for children with ASD (Alsolami, 2022).

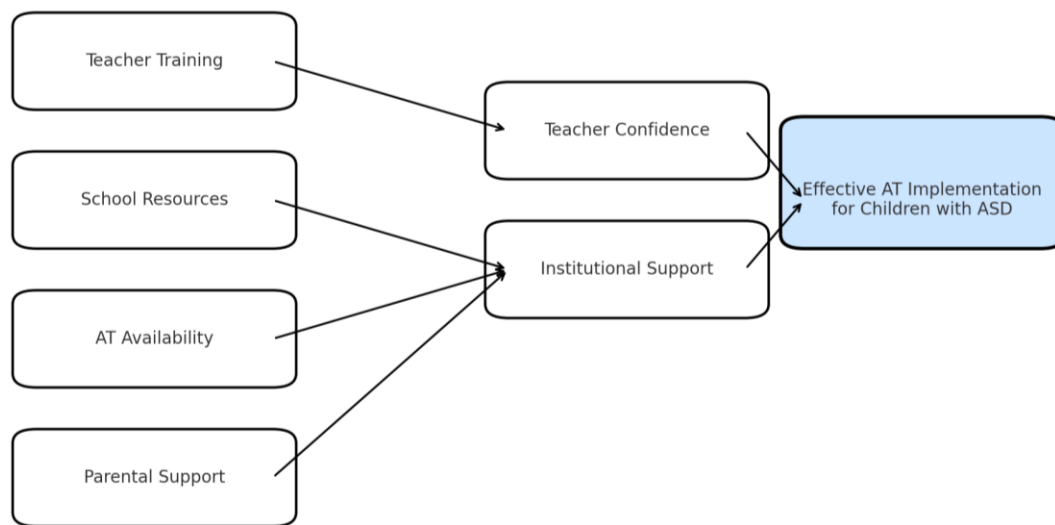
Global and Local Contexts of AT for ASD

Globally, the use of AT for children with ASD is well-documented, but its application in developing countries, including Sri Lanka, is limited by financial constraints, lack of trained personnel, and cultural barriers (Officer & Posarac, 2011). Despite these challenges, AT's potential to support inclusive education and improve the lives of children with ASD is increasingly recognised (Light & McNaughton, 2014). In Sri Lanka, the adoption of AT remains sporadic, with significant gaps in resources and training that need to be addressed to create a more supportive educational environment for children with ASD (UNICEF, 2021; Muttiah et al., 2018; Senarath, 2019).

Conceptual Framework

Figure 1

Conceptual Framework for the Effective Implementation of Assistive Technology (AT) for Children with ASD



This figure illustrates the conceptual framework of the study. It demonstrates how teacher knowledge and training, availability of resources, institutional and parental support, and awareness and advocacy collectively contribute to the effective implementation of AT for children with ASD.

Research Methodology

Research Design

The study employed an explanatory sequential mixed-methods design, commencing with a quantitative cross-sectional survey followed by an exploratory qualitative study (Tariq & Woodman, 2013; Creswell & Clark, 2017). This approach allowed for an initial broad

understanding of the phenomena through quantitative data, which was then explored in greater depth through qualitative insights. By first collecting and analyzing quantitative data, and subsequently using qualitative data to explain or elaborate on the quantitative findings, a comprehensive understanding of the research question was achieved (Radhakrishnan, 2014). This integration of statistical analysis with thematic insights provided a holistic view of the use of AT for children with ASD (Light & McNaughton, 2014; Muttiah et al., 2018).

Population and Sampling

The target population included teachers and principals from primary schools in the Colombo District, Western Province of Sri Lanka, who had experience in teaching children with ASD. The Colombo District was chosen for its wide spread of inclusive schools compared to other districts and better AT access ensuring collecting informative data. A purposive sampling method was used to select participants with specific, homogeneous characteristics relevant to the research question, ensuring an in-depth exploration of their perspectives (Radhakrishnan, 2014). A total sample of 50 teachers was selected for the quantitative survey while the qualitative component included in-depth interviews with 5 teachers and 5 school principals.

Inclusion and Exclusion Criteria

The inclusion criteria for the study required participants to be teachers currently working in government or private schools within the Colombo District, with experience teaching children with ASD either in special education units or inclusive classroom settings. School principals with administrative experience overseeing educational programmes involving students with ASD were also included. All participants were required to provide informed consent and be

willing to participate in the survey or interviews. The exclusion criteria eliminated teachers and principals who had no experience related to teaching or managing students with ASD, educators working outside the Colombo District individuals who were unwilling or unavailable to participate in data collection, and participants who did not complete the questionnaire or interviews to a satisfactory extent.

Pilot Study

A pilot test was conducted with five teachers to assess the clarity and relevance of survey and interview questions. Feedback indicated minor wording issues, which were revised before full data collection. The questionnaire used for this study was developed based on a review of relevant literature, validated through a Delphi review process involving expert feedback to ensure content clarity and relevance.

Data Collection Methods

Data were collected using structured questionnaires and semi-structured interviews, clarified through pilot testing to ensure clarity, validity, and reliability (Creswell & Clark, 2017). The quantitative data was gathered from teachers through questionnaires via Google Forms, using a Likert scale for quantitative measures. Qualitative data were gathered through virtual interviews with five teachers and telephone conversations with five school principals, providing insights into AT implementation challenges and experiences (Braun & Clarke, 2006). This mixed-methods approach enabled triangulation, enhancing the credibility of findings by corroborating data from multiple sources (Venkatesh & Brown, 2005).

Data Analysis

Quantitative data analysed using descriptive statistics, including frequency distributions, percentages, and cross-tabulations to explore relationships between variables (Fowler, 2013). Data visualisation techniques such as bar charts were used to present findings clearly. The qualitative data from teacher and principal interviews were analysed using thematic analysis, following Braun and Clarke's (2006) six-phase framework. All interviews were transcribed verbatim and then coded manually using an inductive approach. Codes were grouped into broader categories to identify patterns and generate key themes related to the use of ATs for children with ASD. This process ensured that themes accurately represented participants' experiences and perspectives while maintaining the richness of the qualitative data. This combined approach allowed the study to capture both the broad trends and nuanced experiences of teachers and principals.

Limitations

The study faced several limitations, including geographic constraints to the Western Province of Sri Lanka and a relatively small sample size, which may limit the generalizability of findings. Additionally, data collection tools were only available in English, potentially excluding non-English speaking participants, and virtual interviews may have limited the depth of data compared to in-person discussions (Creswell, 2013). Also, the limited number of research conducted in the Sri Lankan context was also a challenge. Additionally, the study did not explore in depth the specific reasons behind the preference or avoidance of certain ATs by teachers, which presents an area for future research improvement. Although this study categorised ATs into low-tech, mid-tech, and high-tech groups, it did not quantify the use of individual AT tools such as PECS, audio aids, or tablets. This limits the depth of analysis under

Objective 1 and will be addressed in future research through more detailed tool-specific data collection. Moreover, the qualitative objectives of the study, particularly Objectives 2, 3, and 4, were broadly framed and could have been more specific; this limitation could be addressed in future research design for better clarity and focus. Except for these limitations, the study provided valuable insights into AT usage in Sri Lankan classrooms, highlighting key areas for future research and policy development.

Results and Discussion

The study revealed that while teachers recognise the potential benefits of AT, there are substantial gaps in knowledge, training, and resources that limit its effective use. Many educators lack the confidence and experience required to use a different range of AT devices in the classroom. Additionally, there are external factors (limited infrastructure, lack of parental support, and resistance from senior educators) that further complicate the adoption of AT.

ATs Used by Teachers to Support Children with ASD

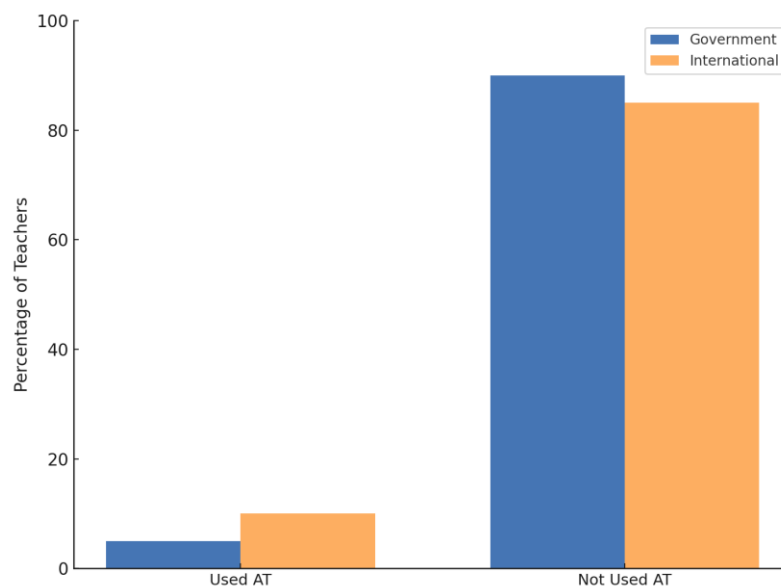
When considering the experience of using AT with children with ASD, survey results indicate that the majority of teachers (92%) have not used AT with children with ASD, while the rest of the teachers (8%) only have used AT with children with ASD.

According to Figure 2, the majority of the teachers have no experience related to using AT with children with ASD. In government schools, approximately, 5% of the teachers have used AT with children with ASD, while approximately, 10% of teachers have used AT with children

with ASD in private schools. This indicates a significant lack of experience in using AT with children with ASD among the government schoolteachers than the teachers in international schools.

Figure 2

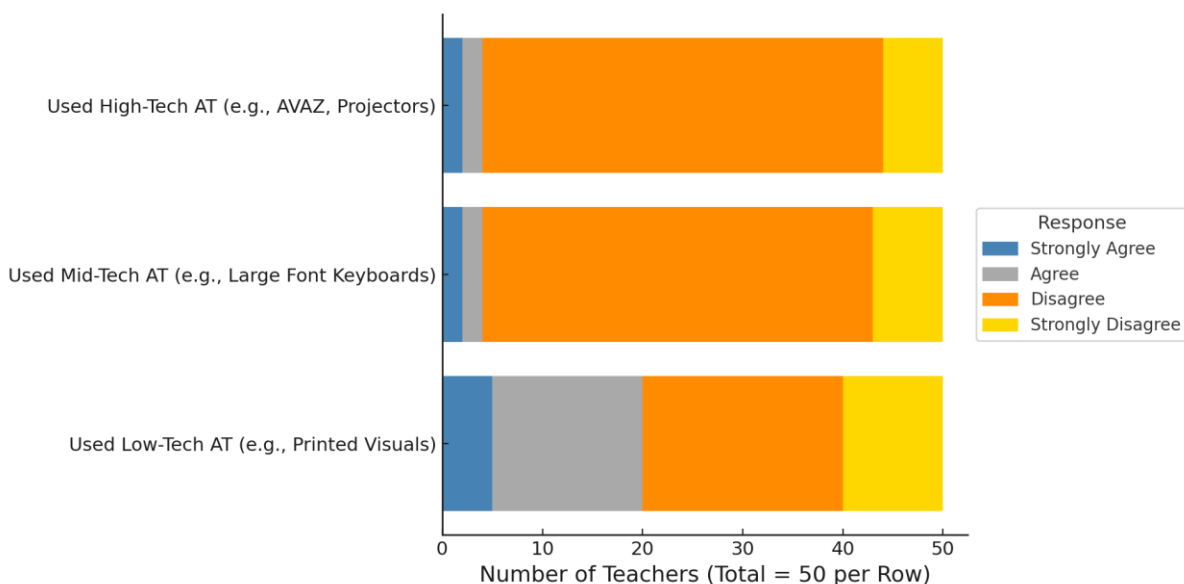
Teachers' experience in using AT with children with ASD



According to Figure 3, the majority (80%) disagreed that they had used high-tech AT with students with ASD in the classrooms. Also, 78% of the teachers who participated in the survey disagreed with the point that they have experience in using mid-tech AT in schools with children with ASD. Further, the majority (30%) of the teachers who participated in the survey agreed with the point about using low-technology devices with children with ASD in classrooms.

Figure 3

Types of ATs used by teachers



The majority of teachers lack adequate experience in using ATs in classrooms with children with ASD. While some teachers have implemented ATs for communication, learning support, and exam accommodation, such usage remains limited.

“I worked with a child with ASD who was a visual learner. Videos, pictures, and images helped him connect words with visuals, making devices highly effective based on his learning needs.” - TN 1

A key reason for this limited exposure is the lack of parental interest or support. Additionally, using ATs in inclusive classrooms presents challenges, particularly when devices distract other students. These factors significantly restrict teachers’ opportunities to gain practical experience with ATs for children with ASD.

Principals echoed similar concerns, citing lack of familiarity and practical knowledge among staff as significant limitations.

“Teachers are not fully familiar with all types of ATs, and there's a general lack of experience in using them effectively in classrooms. Many rely on basic technologies, but when it comes to high-tech solutions, they feel less confident.” - PN 1

Despite these challenges, most teachers agreed that ATs make teaching more convenient. They support lessons, aid communication, and improve reading and writing. Since many children with ASD are visual learners, tools such as pictures, videos, picture communication apps, and literacy apps are viewed as highly effective. Increased use of adaptable ATs would further benefit students by accommodating their diverse needs.

“Using AT makes teaching easier and helps students understand better. However, better resources and more technological tools are needed to promote and improve its use effectively.” - TN 2

“ATs certainly have their place, but we are limited by both the lack of resources and necessary training. Teachers need more hands-on experience with these tools to feel confident about using them.” - PN 4

Teachers mostly rely on low-tech tools such as visual schedules, picture cards, and basic communication aids. These tools are easier to implement and require minimal training, although they lack the advanced features of more sophisticated technologies.

“We use mostly low-tech tools like visual schedules and picture cards because they are easier for us to manage and don’t require much training.” - TN 3

This preference suggests a reluctance to engage in technologies that require technical expertise or additional effort. High-tech devices, like speech-generating devices and tablets, are rarely used. When employed, they are often used outside the regular classroom due to concerns over distraction and limited teacher confidence.

“I’ve only attended one workshop on ATs, and most of what I know is self-taught. Parents are often sceptical about using devices like tablets, fearing that their children will become too reliant on them or distracted.” - TN 5

Audio aids and video content are used more as a last resort rather than as a core teaching strategy.

“We use videos and audio aids mainly because they work better for kids who refuse to engage in printed materials.” - TN 2

Teachers also worry that high-tech tools may encourage over-reliance and cause distractions in class.

“High-tech devices can be distracting for the whole class, and sometimes, children become too dependent on them. So, we try to limit their use.” - TN 4

Though ATs hold significant potential to enhance learning for children with ASD, their adoption is hindered by insufficient training, institutional support, and concerns over their

impact in classrooms. Addressing these gaps through training, administrative backing, and increased awareness among parents can foster a more inclusive and effective educational environment.

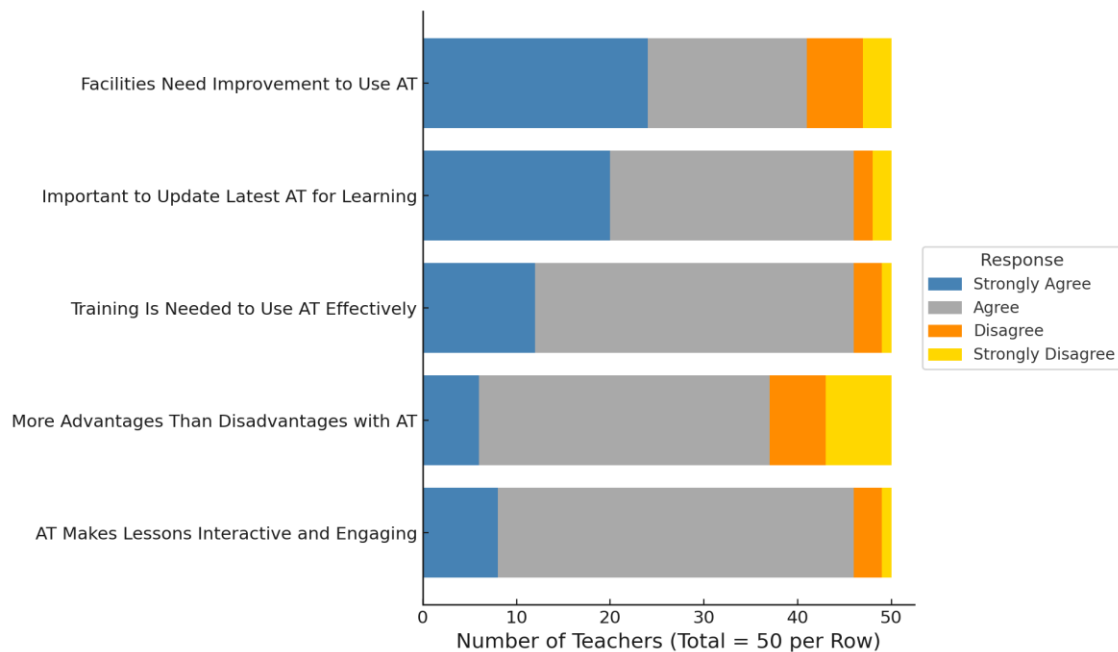
Teachers' Perception of the Effective Use of ATs to Support Children with ASD

All participants in the survey agreed with all the points which were mentioned under the perception section of the survey, which is a significant strength to incorporate more AT with the teaching-learning procedure for children with ASD. Figure 4 shows that the highest percentage of the teachers (68%) have agreed with the point that using AT with children with ASD makes the teaching-learning procedure interactive and interesting. 58% of the teachers who participated in the survey agreed with the point about the significance of having proper understanding and training about using ATs which is the second highest percentage of agreement. 52% of the teachers who work with the children with ASD have agreed with the importance of getting frequently updated about the latest ATs to incorporate them with the teaching-learning process.

When considering the highest percentage of strongly agreed points, 44% of teachers who participated in the survey strongly agreed with doing the necessary environment modification in the classroom and in the school premises to use AT, while 40% is the second highest percentage for which has received for the point about frequently updating about the AT to incorporate it in the teaching-learning process. 12% of the participants have strongly disagreed with the point about advantages being higher than disadvantages of using AT in the classrooms for children with ASD which is the most significant disagreement for the points under perception.

Figure 4

Teachers' Perceptions of AT



When recognising the attitudes of teachers regarding the use of AT in classrooms, most of the interviewees mentioned that it is highly beneficial for teaching-learning processes. AT can simplify the presentation of information through pictures or videos or offer alternative communication methods, such as picture-based or voice-based communication. Additionally, some teachers find that AT is advantageous in inclusive environments, as it can help all students understand lessons more effectively.

Some mentioned that high-tech AT devices, such as tablets and laptops, can be distracting for other kids in the classroom, leading them to lose focus on their studies. They suggested prioritising low or mid-tech tools that help maintain classroom engagement instead of relying on high-tech devices.

“Children may get distracted by high-tech aids like tablets in inclusive settings, causing disruptions. Low-tech tools like buzzers can creatively engage all students without losing focus.” - PN 1

They emphasised the need to balance technology use with maintaining a productive classroom environment.

Regarding the facilities and support provided by school authorities, many expressed their dissatisfaction. TN 4 shared uncertainty about the existence of any school programmes aimed at improving knowledge about AT.

"I've heard of some organisations trying to promote this knowledge, but I'm not sure if schools themselves are actively involved." - TN 4

PN 2 highlighted that there is a general lack of enthusiasm among some school management teams towards integrating ATs, which affects the overall perception of its potential effectiveness.

Moreover, some interviewees indicated that traditional teaching methods were still preferred by many senior educators, who may be reluctant to adopt new technologies.

"Senior teachers often prefer sticking to the books and are unconvinced about the benefits of ATs." - TN 3

"Resistance from experienced teachers makes it challenging to introduce new tools and technologies into the classroom, creating a barrier to modernization." - PN 3

Despite these mixed perceptions, many teachers demonstrated a willingness to learn and use AT. They recognised that regular updates and training are crucial for effective implementation. TN 4 highlighted the importance of continuous training:

"If we have regular training sessions on AT, it will significantly enhance our ability to use these tools effectively." - TN 4

PN 4 offered a similar perspective, emphasising the necessity of training programmes tailored specifically to ATs.

"The gap isn't just in knowledge; it's in the practical application. Structured, hands-on training can make a difference." - PN 4

Most teachers showed enthusiasm about keeping up-to-date with new technologies, acknowledging that staying current is vital for their professional and personal development.

"Accessing online resources is an excellent way to stay informed about the latest developments in AT." - TN 5

PN 5 also highlighted the role of self-initiated learning:

"We have to take individual responsibility to educate ourselves using available resources like webinars and online courses to keep up with the advancements in AT." - PN 5

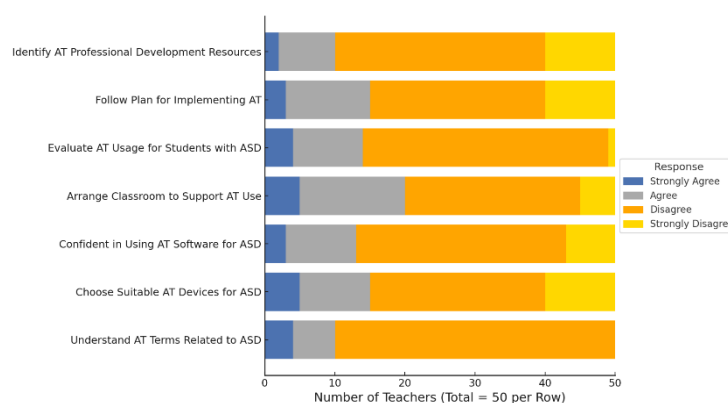
Overall, while perceptions are generally positive towards the use of AT in supporting children with ASD, there is a strong recognition of the need for ongoing training and updated knowledge to fully leverage its benefits in classroom settings.

Challenges Faced by Teachers When Using ATs to Support Children with ASD

Figure 4 shows that 80% of participants disagreed on having adequate knowledge of AT concepts and terms related to ASD, while 70% disagreed on knowledge of AT usage evaluation methods. Only 10% of teachers agreed they understand AT types from low- to high-tech based on ASD severity; the highest agreement in the survey. Strong agreement was limited to two components: 4% for understanding AT concepts and terms and 2% for identifying professional development resources.

Figure 4

Knowledge of the Special Education Teachers about AT



Most teachers do not possess adequate knowledge about ATs used for children with ASD. While some are aware of the basic classification of AT into low-tech, mid-tech, and high-tech categories, applying this knowledge in practical classroom settings proves to be a significant

challenge. Some educators refer to hearing aids, typically used with students with hearing impairments, as the AT tools they are most familiar with.

“So... I have some little knowledge about ATs. If we talk about types, low-tech, medium-tech, and high-tech are the types of AT.” - TN 5

Although they may have a theoretical understanding, most teachers lack practical experience, particularly with tools like Augmentative and Alternative Communication (AAC) devices, due to the absence of proper training and hands-on learning opportunities.

“Actually, I do not have any practical experience with this topic. I only know the theoretical aspects. ATs, as far as I know, are used to help people with disabilities function more effectively.” - TN 2

This limited understanding results in reliance on a narrow selection of ATs. Teachers tend to use familiar devices repeatedly, which restricts exploration and the ability to apply a wider variety of tools that could better support children with ASD. As a result, Sri Lankan special education classrooms often see only a small selection of AT options in use.

A core challenge lies in the lack of structured training programmes. Many teachers rely on self-directed learning, such as watching YouTube videos or using Google searches, to understand AT tools. However, this informal method falls short of offering the depth and confidence required to implement such technologies effectively in real classrooms. Additionally, teachers rarely receive hands-on experience, leaving them uncertain about how to operate AT devices or how to tailor them to individual students' needs.

“I believe that high-tech AT is currently the best solution for children with ASD to live more independently. That is why I've been researching on this topic online, trying to find methods to help children with ASD.” - TN 5

Principals also recognised these gaps. Several admitted that their schools lack the infrastructure or financial resources needed to provide continuous training for teachers.

“Our teachers are keen to learn, but we do not have enough budget or infrastructure to provide continuous training sessions on AT.” - PN 1

"The challenge is also in the infrastructure. Our classrooms are not always equipped to integrate high-tech ATs. This lack of infrastructure often discourages teachers from experimenting with or adopting these tools." - PN 2

Beyond training, a lack of confidence among teachers significantly affects implementation. Many are unsure how to operate these tools, when to use them, or how to integrate them into daily classroom routines. This hesitation often results in limited or incorrect use of ATs. Environmental constraints compound the issue. Many schools do not provide the resources or space for experimentation or practice. High-tech tools such as tablets or speech-generating apps can distract other students in inclusive classrooms, making it difficult to use them regularly. As a result, AT use is often restricted to separate resource rooms or specialized units.

“In inclusive classrooms, using devices like tablets often distracts other students, reducing their usage. AT is mostly used in specialised units or outside the classroom.” - TN 1

Principals acknowledged the challenges of maintaining inclusivity while managing AT use.

“In mixed classrooms, the use of ATs can cause disruptions among other students, making it hard to maintain an inclusive environment.” - PN 3

“Some teachers are not fully comfortable with integrating technology into their lessons due to the potential for distraction and lack of proper support from school administration.” - PN 4

Another often-overlooked barrier is parental perception. Many parents are unfamiliar with ATs or fear that increased screen time could cause dependency or reduce their child’s engagement with traditional learning materials. Some believe paper-based methods are more effective, which in turn influences teachers’ willingness to adopt new tools.

“Sometimes, parents might be concerned about their child's screen time. If we use technology devices in addition to their regular screen time, parents may worry about whether it's beneficial and whether their child will become too dependent on technology instead of using paper-based methods.” - TN 1

“Still, as teachers, we are willing to use all methods to address the challenges faced by children with disabilities, including ASD. However, we often refrain from using new methods because parents are not keen on using ATs, and they are often unaware of these technologies.” - TN 5

School principals echoed these sentiments.

“We have observed that some parents are sceptical about using high-tech devices, fearing that it may replace traditional learning methods and cause dependency issues.” - PN 5

Taken together, the challenges ranging from insufficient training and limited hands-on experience, to infrastructure gaps, classroom management issues, and parental resistance create significant barriers to the effective implementation of ATs in Sri Lankan classrooms. Without comprehensive support and strategic interventions, the potential of AT to support children with ASD remains largely untapped.

Proposed suggestions for effectively implementing AT in classrooms for children with ASD.

Based on the survey findings, there is a clear need for more professional development and training to help teachers improve their knowledge and confidence in using AT. Teachers also stressed the importance of raising awareness among parents and school administrators to promote a more supportive environment for AT adoption. Furthermore, the results indicate a need for better allocation of resources to provide sufficient technological tools and infrastructure so that teachers can access a range of AT options suited to their students' individual needs.

Teachers recommended informing school authorities, government officials, and senior educators about the value of AT, not only for students with ASD but for all learners in inclusive classrooms. They proposed conducting workshops and developing online platforms to increase understanding and challenge common misconceptions about AT.

“Teachers face barriers to using AT in classrooms and can’t force its adoption. However, implementing AT benefits all students, not just those with ASD, by enhancing education. Workshops and websites are needed to promote awareness and usage.” - TN 5

Interviewees also suggested that teachers should be given opportunities to observe clinical placements to see how professionals use AT with children with ASD.

“In clinical placements like Ayati, clinicians use AT for children. A one-week visit during vacation could allow observation and guidance on using devices, such as teaching specific subjects through tablet apps.” - TN 1

Parental awareness was also identified as a concern. Many parents feel uneasy about teachers using digital devices in class. This discomfort is not limited to parents of children with ASD but also affects others in inclusive classrooms.

"We need to enhance the knowledge about AT among parents through workshops and meetings as they also should know the importance of AT. - TN 5

Teachers further noted the lack of equipment, such as devices to show videos or apps. The shortage of devices, combined with children’s limited ability to wait, makes implementation difficult. Additionally, classrooms often lack electricity, internet, and plug points further complicating AT use.

“We have limited devices in school, making it hard to meet demand as multiple students need the same device. Having more devices would ensure effective and timely use for children with ASD.” - TN 1

Addressing these concerns can lead to better AT integration, making classrooms more inclusive and supportive for all students.

Conclusion

This research reveals the current use of ATs to support children with ASD in Sri Lanka, showing that teachers use a range of tools, from low-tech solutions like visual schedules to mid-tech devices such as audio aids. However, the use of high-tech tools, including speech-generating devices or applications designed to enhance communication, remains limited. This underutilization of advanced technologies is largely because of the teachers' lack of familiarity and confidence, leading them to rely on simpler, more familiar tools, aligning with Schaaf's (2018) emphasis on the need for structured training programmes to improve the effective use of AT.

The perception of AT among teachers is generally positive, with most recognizing its potential to enhance learning, communication, and social interaction for students with ASD. However, this researcher notes a significant gap between awareness of AT's benefits and teachers' readiness to implement these tools effectively. This gap is consistent with findings by Schaaf (2018), who highlighted that insufficient training and professional development often leave teachers uncertain about integrating higher-tech tools into their classrooms, underscoring the need for ongoing, structured training to build confidence and competence.

Challenges to effective AT use extend beyond individual teacher readiness. This research highlights that institutional resistance, particularly from school management and some parents, hampers the broader adoption of AT. High-tech devices are frequently perceived as potentially disruptive in inclusive classrooms, complicating the balance of needs between neurotypical students and those using AT. This observation reflects Jones's (2014) findings, which also noted that resource constraints and perceptions of disruption can limit the implementation of advanced AT solutions in educational settings.

To overcome these barriers, this research stresses the importance of a collaborative approach. It calls for coordinated efforts among teachers, school authorities, and policymakers to create a supportive structure for AT integration. By fostering a culture of innovation and ensuring the provision of necessary resources and training, schools can better support the use of AT not only for children with ASD but also for the broader student population. This perspective is aligned with the work of Crowe et al. (2022) and Schaaf (2018), who advocate for collective action and institutional support to advance the adoption of AT in educational environments.

Recommendations

The study highlights the growing recognition of AT's importance for children with ASD in Sri Lankan schools but identifies significant gaps in implementation. Recommendations include hands-on training for teachers on low- and high-tech AT, observation opportunities in clinical settings, and peer networks for experience sharing. Structured professional development programmes and awareness campaigns for school authorities can improve perceptions of AT.

Policy revisions are needed to formally integrate AT into classroom practices. Enhancing infrastructure, such as internet access and charging stations, and increasing AT availability are crucial. Advocacy efforts should reduce resistance among parents and school management, encouraging experimentation with diverse AT solutions. Regular feedback mechanisms should assess AT effectiveness and guide improvements. Collaboration among teachers, administrators, policymakers, and external agencies is vital to providing comprehensive support. Future research should explore AT's long-term impact, regional disparities, parent and student perspectives, and low-tech solutions in resource-limited settings. By implementing these strategies, schools can create an inclusive environment, enhancing learning outcomes for children with ASD.

Acknowledgment

The author gratefully acknowledges Dr. Samanthi Jayasinghe for her guidance throughout the study and thesis writing process. The author also wishes to thank Dr. S. Kugamoorthy for her guidance during the initial stage of the study. Special thanks are extended to all the participants whose valuable contributions and insights made this research possible.

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Disclosure statement: No potential conflict of interest was reported by the author.

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