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Teachers' perceptions of literacy instruction for their learners with autism spectrum disorder

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Authors:
Hannah J.W. Human[1]
Marien A. Graham[2]
Juan Bornman[1]

Affiliations:
[1]Centre for Augmentative and Alternative Communication, Faculty of Humanities, University of Pretoria, Pretoria, South Africa

[2]Department of Mathematics Education, College of Education, University of South Africa, Pretoria, South Africa

Corresponding author:
Juan Bornman,
juanb@sun.ac.za

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Background: Literacy development in learners with autism spectrum disorder (ASD) differs from that of neurotypical peers. Many individuals with ASD, particularly those with complex communication needs, enter adulthood without literacy skills, which affects employment opportunities. Teachers' perceptions of their learners' literacy abilities influence educational outcomes.

Aim: This study aims to explore teachers' perceptions of literacy instruction for learners with ASD.

Methods: A descriptive, cross-sectional design using a paper-based survey was conducted across seven public schools for learners with special educational needs in the broader Johannesburg metro, involving 67 teachers.

Results: Teachers defined literacy and digital literacy, revealing their views on teaching literacy to learners with ASD. They identified factors that positively and negatively impacted literacy instruction and shared their perceptions of how learners with ASD engage in literacy learning. Most teachers doubted that their learners with ASD could develop conventional literacy skills, and many believed they should not be exposed to digital literacy, citing readiness concerns. Barriers to effective literacy instruction were noted, although many teachers applied ASD-specific teaching strategies in their literacy instruction.

Conclusion: This study highlights a need for targeted teacher training on literacy development and instructional strategies, including digital literacy, for learners with ASD. Such training should build on teachers' existing knowledge while addressing identified misconceptions.

Contribution: This study contributes to the literature by highlighting how teachers' perceptions of literacy and digital literacy for learners with ASD are shaped by functional priorities, limited expectations, and inconsistent definitions, ultimately influencing their instructional practices and use of technology.

Keywords: literacy; autism spectrum disorder; teachers; neurodiversity; inclusion; augmentative and alternative communication.

Introduction

Learners with autism spectrum disorder (ASD) have unique literacy development pathways, unlike those of neurotypical peers or learners with other developmental disorders, because of several interconnected reasons rooted in the neurological, developmental and individual diversity associated with autism (Peng et al. 2022). This affects their ability to access traditional literacy curricula. Autism spectrum disorder is a neurodevelopmental condition characterised by difficulties in social communication and interaction, as well as restricted, repetitive behaviours and narrowly focused interests. These features vary widely across individuals, resulting in differing support needs – from minimal to intensive – depending on personal profiles and contexts (American Psychiatric Association 2013). Consequently, learners with ASD present with heterogeneous word decoding and language comprehension skills. The past decade has seen significant growth in disability advocacy, driven by increased autism awareness among professionals and the public. This shift is reflected in the rising number of research publications focused on understanding ASD and exploring diverse approaches to its identification, support,

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intervention and education for individuals with ASD and their families (Macoun, Bedir & Sheehan 2022). While efforts have been made to include the most current and relevant literature, not all recent research directly aligns with the focus or context of this study. Therefore, several older, seminal works have also been retained to illustrate the historical development of key concepts and to provide a foundational understanding of the field.

Difficulties with reading comprehension in this population have been linked to communication, language and cognitive impairments (McIntyre et al. 2021). Social communication impairments also impact literacy, as learners have an impaired understanding of written text as a form of communication with an intended purpose. Many learners with ASD tend to have a strength in decoding text at a word level; however, they have difficulty with language and reading comprehension (Peng et al. 2022). Research shows that receptive and expressive language skills are key to understanding written text, while restricted interests limit exposure to broader topics, reducing the knowledge base for novel text (McIntyre et al. 2021). Autism spectrum disorder is the fastest-growing developmental disability, and understanding the experiences of this expanding population and their specific literacy challenges is thus pertinent (Macoun et al. 2022).

Theoretical framework of literacy factors in learners with autism spectrum disorder

Influence of cognition

Three core features of autism offer a cognitive explanation for understanding the development of literacy in learners with ASD. Firstly, *theory of mind* refers to a learner's ability to understand the perspective of others (Lecheler et al. 2020). Learners with ASD, who often experience delays or impairments in theory of mind, may struggle to understand storybook characters, relate those characters' feelings to their own experiences and predict behaviour within a given context. Secondly, *weak central coherence* refers to a cognitive style where learners focus on details rather than the whole (McDermott 2025), and without this broader processing, learners with ASD struggle to grasp the overall message of a story, which also impacts their reading comprehension. Thirdly, *executive functioning* refers to the set of cognitive skills used to manage and organise information, and without this, learners with ASD struggle to sequence story events, access prior knowledge and make connections (Hall 2023). Collectively, these cognitive explanations provide a framework for understanding the reading comprehension difficulties often observed in learners with ASD.

Influence of speech

Around 40% of learners with ASD do not develop speech and use echolalia, or idiosyncratic words and phrases (Beukelman & Light 2020), which also negatively impacts their literacy development. Phonics instruction, which focuses on sound manipulation as the basis of decoding and encoding, is limited for learners with ASD, and reduced speech hampers their opportunities to learn this basic literacy skill (Ainsworth et al. 2016). Learners with ASD are often perceived as 'not ready' for literacy instruction until they have mastered traditional phonics (Hall 2023).

Influence of language

As explained earlier, most children with ASD have receptive and/or expressive language impairments (Beukelman & Light 2020). Context processing (i.e. vocabulary and world knowledge to derive semantic meaning from text) also impacts literacy (Beukelman & Light 2020). Language plays a central role in literacy learning (Tárraga-Mínguez, Gomez-Marí & Sanz-Cervera 2020). The impact of language delay on literacy development in children with ASD showed that despite their decoding skills, their delayed spoken language negatively impacted their reading comprehension abilities (Whalon & Hart 2011). As seen from this discussion, many intrinsic factors impact the literacy development of learners with ASD.

A dynamic definition of literacy

Learners requiring more intensive support are routinely denied the opportunity for adequate literacy instruction owing to poor definitions and limited understanding of the construct (Keefe & Copeland 2011). Pillay and Kathard (2018) suggested that for individuals with complex communication needs, such as those with ASD, interventions in South Africa have primarily been based on the colonial north medical model, focusing on their deficits. This perpetuates the belief that learners with support needs have deficits and thus would be denied access to literacy education. Additionally, literacy develops across an individual's lifetime. It is important to determine whether teachers have an inclusive, optimistic understanding of literacy instruction for learners with ASD. The 'narrative of pessimism' (p. 175) coined by Kliewer et al. (2008) refers to the belief that learners with disabilities cannot acquire literacy skills and are therefore not afforded opportunities for literacy instruction, ultimately becoming a self-fulfilling prophecy. In contrast, Keefe and Copeland (2011) posited a 'narrative of optimism' (p. 92), based on presuming competence for all individuals regardless of their abilities.

This sentiment of presuming competence is echoed by UNESCO (2017), which defines a literate person as someone:

> […*W*]ho can engage in all those activities in which literacy is required for effective functioning of his (her) group and community and also for enabling him (her) to continue to use reading, writing and calculation for his (her) own and the community's development. (p. 15)

This definition empowers individuals with ASD to develop literacy that is both personally meaningful and socially impactful, providing opportunities to contribute to their own communities and potentially facilitating greater access to

employment. In alignment with the UNESCO definition of literacy, the World Health Organization's International Classification of Functioning, Disability and Health (ICF) aims to provide a standard language and framework for health-related states, which includes 'activity' and 'participation', in which literacy in an education and employment context forms a vital element (Sulaiman et al. 2021).

South Africa's national Department of Basic Education (DBE 2018) states that every learner should be able to read, write, count and think (DoE 2008). However, this statement is broad and does not support teachers or schools in defining literacy and in guiding literacy development in learners requiring more intensive support, such as some learners with ASD. Therefore, a definition of literacy for learners with ASD should acknowledge the dynamic and individual nature of their literacy development. Furthermore, a relevant literacy definition for this population should also acknowledge their strengths and presume competence (Ainsworth et al. 2016; UNESCO 2017).

Definitions of literacy are dynamic, shaped by temporal and contextual factors, and they ultimately influence perceptions and practices. In response to this, Keefe and Copeland (2011) collaborated with a group of teachers and community providers to explore how literacy was defined in their context. They found that when teachers adopted a narrow definition of literacy, it often led to low expectations and limited opportunities for learners with disabilities. Based on their findings, Keefe and Copeland (2011) proposed five principles to guide a more inclusive understanding of literacy. They defined literacy as: (1) a skill that all individuals are capable of developing; (2) a human right; (3) a dynamic inter-connected construct that depends on interactions with others; (4) a form of communication for which competence should be presumed and (5) a collective responsibility, wherein all members of the community support meaning-making through multiple modes of communication for both transmission and reception of information.

As technology begins to permeate all aspects of daily life, it is important to consider the role digital literacy plays for learners with ASD (Cihak et al. 2015). Digital literacy allows learners with ASD an opportunity to be motivated and engaged in learning – via touch, speech and audio – which is more consistent with real-world experiences (Riga, Ioannidi & Papauiannis 2021). The Australian and New Zealand Institute for Information Literacy suggests a link between digital literacy, lifelong learning and independence (Williams 2006). Williams (2006) argues that even those individuals with limited literacy abilities may have far stronger digital and computer literacy skills owing to the visual nature of 'technology language', the learning gains garnered through motivation and the opportunities for repetition. In addition to the relevance of digital literacy for all learners, digital literacy offers an additional resource for individuals with ASD, in personal, academic and employment pursuits (Cihak et al. 2015).

Building on the concept of digital literacy and Keefe and Copeland's (2011) *narrative of optimism*, this study proposes a dynamic definition of literacy, conceptualised as four principles of meaningful literacy for individuals with ASD: (1) a skill that can be developed by any individual, thereby highlighting the right of all to receive continued literacy instruction (DoE 2008; Keefe & Copeland 2011); (2) a tool to access participation within one's own community (Light & Beukelman 2020); (3) a written form of language that can take on many different forms (including text, digital navigation tools, logographic imagery and pictures paired with labels) (Adams 2024) and (4) a skill with a dynamic and unique pathway which continues to develop in individuals with ASD (Keefe & Copeland 2011; UNDESA 2022; UNESCO 2017). Beyond a robust understanding of literacy for learners with ASD, the nature of literacy instruction is important to investigate.

Literacy instruction for individuals with autism spectrum disorder

The school environment is the primary source of formal literacy instruction, and learners with ASD require additional practice to meet literacy demands (Light & Beukelman 2020); however, they often receive less literacy instruction than neurotypical peers as time is spent on non-academic activities such as feeding, toileting and therapies (Medina et al. 2021).

Learners with ASD, particularly those with limited speech, are often excluded from literacy education as they are unable to orally produce phonic sounds, which render traditional phonics instruction ineffective (Ainsworth et al. 2016). As most curricula are designed for speaking learners, teachers may bypass literacy altogether, contributing to the high illiteracy rates among individuals with ASD (Medina et al. 2021).

Learners with ASD require explicit instruction, paired with visual support, to strengthen their comprehension skills (Walker et al. 2023). Whalon and Hart's (2011) study on the three learners with ASD mentioned earlier reported that it was not the severity of the learner's language delay that impacted the extent of reading comprehension, but that the reading instruction lacked a focus on targeted comprehension strategies. Learners with ASD requiring more intensive support require carefully designed opportunities to participate in literacy-focused classroom discussions, supported by inclusive instruction (Medina et al. 2021). Owing to weaknesses in reading comprehension, learners with ASD benefit from literacy instruction that is meaning-focused (Whalon, Otaiba & Delano 2009). A study of South African special schools found that teachers identified the absence of a specific curriculum and syllabus to teach learners with ASD, which results in learners with ASD not progressing as they should (Sumbane et al. 2023). Therefore, the nature of the literacy instruction paired with a guiding resource may impact the quality of literacy gains made by learners with ASD.

Technology in literacy development has begun to play a crucial role for learners with ASD who are visual learners, rendering technology that incorporates visuals as effective (Walker et al. 2023; Kagohara et al. 2013). This is echoed in White Paper 7 (DoE 2004), which aims to ensure technology access for all learners, including those with ASD, to ultimately develop computer literacy skills in the digital age.

While literacy development is a highly favoured outcome for learners with ASD, South African teachers face many barriers to the implementation of literacy instruction. In a study investigating the experiences of South African teachers who work with learners with ASD, it was found that education outcomes were negatively impacted by classroom overcrowding (Nthibeli, Griffiths & Bekker 2022). Overpopulation in South African public schools is a notable problem; however, for special education schools that accommodate learners who require greater attention and individualised support, this could greatly impact the quality of literacy instruction (Nthibeli et al. 2022). Globally, it has been found that while teachers working with learners requiring more intensive support acknowledge the potential benefits of technology, they are also daunted by the added burden of responsibility of understanding and using technology with their learners (Flanagan & Shoffner 2013). In South Africa, limited resources for literacy instruction could impact what is prioritised in the budget. For example, in high-risk areas, basic reading books and stationery may be prioritised over technology, as having tech resources could make the school a target for crime (DoE 2008). South African learners with ASD often do not progress academically (Sefotho & Onyishi 2021), inhibiting the development of their literacy skills from emergent literacy to conventional literacy skills (Clendon et al. 2021). It is therefore important to explore the beliefs and attitudes held by South African teachers who influence their use of effective, evidence-based strategies for learners with ASD.

Teachers' perspectives and experiences with learners with autism spectrum disorder

Teaching style, teacher work demands, focus on learner engagement, teacher attitudes and teacher understanding of the needs of learners with ASD have an impact on the successful inclusion and education outcomes of said learners with ASD (Finnegan 2019). Rosenthal and Jacobson (1968) introduced the concept of the self-fulfilling prophecy in educational settings, known as the *Pygmalion effect* (also referred to as the *Rosenthal effect*). This psychological phenomenon describes how teachers' expectations – whether high or low – can influence learners' performance. Specifically, learners who are expected to succeed often do, reinforcing a virtuous cycle of achievement. In contrast, low teachers' expectations can lead to diminished performance, perpetuating a vicious cycle of underachievement (Cobos-Sanchiz et al. 2022; Rosenthal & Jacobson 1968).

Outdated theories on literacy acquisition in neurotypical peers have shaped teachers' perceptions towards literacy instruction in their learners with ASD (Hall 2023). False beliefs held by teachers, as well as prevailing myths (e.g. that a learner with ASD is too cognitively impaired for literacy instruction, or not ready for literacy instruction), have influenced teachers' decisions in teaching literacy skills (Hall 2023; Keefe & Copeland 2011). Recently, teachers' perspectives of literacy instruction for learners with ASD appear to have shifted, with growing awareness of the type of literacy support needed, including digital literacy and visual support (Walker et al. 2023).

Poor literacy development in learners requiring more intensive support is linked to pervasive teacher beliefs that these learners are incapable of acquiring literacy skills (Keefe & Copeland 2011). Teachers who believe that their learners with ASD cannot develop literacy will not practise effective classroom literacy instruction. According to Gómez-Marí et al. (2022), teachers who anticipate either functional or academic pathways for their learners tend to align their instruction accordingly – focusing on tasks that match those expectations. Developing a clearer understanding of teachers' attitudes towards literacy instruction for learners with ASD can therefore provide valuable insight into how literacy education is shaped in practice.

International research on literacy in individuals with ASD is growing (Macoun et al. 2022); however, most research on literacy instruction for learners with ASD is conducted in Europe and North America, with little known about the experiences of South African teachers in this area (Nthibeli et al. 2022). Given South Africa's focus on improving literacy, coupled with the poor literacy outcomes for learners with ASD, it is important to investigate teachers' perspectives on literacy instruction for their learners with ASD, especially with limited local data.

Research methods and design

This study aims to describe teachers' perceptions of literacy instruction for learners with ASD enrolled in schools for learners with special educational needs (referred to as Learners with Special Education Needs [LSEN] schools) in Gauteng by: (1) determining teachers' perceptions of the value of literacy instruction for their learners with ASD; (2) describing the nature of teachers' self-reported literacy instruction provided in terms of type (traditional and/or digital), duration, range and quality; and (3) determining underlying challenges that impact literacy instruction as experienced by teachers.

Design

A descriptive, cross-sectional design (Omair 2015) was used. The study included three steps, namely: (1) instrument development to create the survey with a solid theoretical basis as supported by the reviewed literature as well as expert review; (2) pilot study to ascertain the appropriacy of the procedures and materials and (3) main study to collect, analyse and interpret data.

Materials

The custom-designed paper-based survey (Online Appendix 1), developed as described in Human (2023), was informed by prior research on teachers' perceptions of disability in South Africa and internationally (e.g. Bornman & Donohue 2013; Rombouts, Maes & Zink 2017). It included five sections: demographics (Section A), school environment and resources (Section B), teachers' views and practices on literacy (Section C), literacy instruction for learners with ASD (Section D) and challenges in teaching literacy (Section E). Most items used a 5-point Likert scale, with some open-ended questions in Section E.

The pilot study aimed to assess the survey's feasibility and acceptability in terms of length, clarity and ease of completion (Morin 2023). The procedures suggested for the main study were followed, except that teachers were recruited from private schools to preserve the public-school sample (and sample size pool). Pilot participants mostly suggested procedural changes, such as using telephone and e-mail correspondence to ensure that the principals understand the selection criteria and are aware of the study; being present when teachers read information letter and consent forms to address any potential questions immediately; and being involved during teacher selection to ensure that selected participants meet the criteria. Minor rewording of some questions was suggested. On average, it took participants 30 min to complete the survey.

TABLE 1: Participant description (N = 67).

Demographic details	%
Sex	
Female	88
Male	12
Qualification	
Teaching diploma	23
Bachelor's degree	51
Honours degree	19
Master's degree	7
Total teaching experience	
1–5 years	24
6–10 years	21
11–20 years	21
21–30 years	18
> 30 years	16
Total LSEN experience	
1–5 years	36
6–10 years	32
11–20 years	22
21–30 years	10
> 30 years	0
Teaching phase	
Foundation phase	57
Middle phase	18
Senior phase	18
Vocational phase	13

Note: The percentages in the teaching phase section sum to 106%, as participants could select multiple phases.

LSEN, learners with special educational needs.

Participants

A two-pronged approach was used to identify potential participants: firstly, schools in the broader Johannesburg Metro, namely, Ekurhuleni North, Johannesburg North and Johannesburg West, serving learners with ASD were selected. Secondly, teachers who met the selection criteria (i.e. 1+ year experience teaching learners with ASD, proficiency in English and consented to participate). Non-random purposive sampling using these pre-described selection criteria was employed to ensure in-depth knowledge of the topic. Of 21 public Gauteng LSEN schools (DBE 2018), two were excluded for not serving learners with ASD. Learners with special educational needs, including those in schools for specific disabilities (i.e. learners with cerebral palsy, hearing impairments, and visual impairments), were excluded from the study. This is because these schools do not necessarily offer educational services to learners with ASD.

Of the 19 remaining schools, seven principals consented, comprising one school for learners with moderate intellectual impairment, two schools for learners with severe intellectual impairment and an autism unit, three autism specific schools and one remedial education school. A total of 158 teachers met the selection criteria, of whom 79 consented (50%) and, of those, 67 completed the survey in full (85%).

Table 1 shows that 88% of teachers were female, aged between 24 and 71 years (mean [M] = 44.2, standard deviation [SD] = 12.1). Most participants were over 41 years old (58%), with 35% aged 51–60 years, reflecting the ageing teacher workforce in South Africa (Donohue & Bornman 2023). Just over half held a bachelor's degree (51%), with formal qualifications ranging from a teaching diploma to a master's degree. Their overall teaching experience was relatively evenly distributed and ranged from 1 to 44 years (M = 16.3, SD = 12), with the largest proportion of participants having 1 to 5 years of experience (24%). Although most participants were over 41 years old (58%), only 18% of teachers had 21 to 30 years of experience, and only 16% of teachers had over 30 years of experience. The pattern of teaching experience at schools for LSEN echoes the pattern of total teaching experience, ranging from 1 to 28 years, with an average of 9.3 years (SD = 7.4). The participant's largest proportion of teaching experience at schools for LSEN was in the 1 to 5 years category, with no participants having had more than 30 years' experience working in schools for LSEN. Foundation phase was the most prevalent phase taught, with 56.7% of teachers teaching either only in the foundation phase or a combination of the foundation phase and another phase. Only one participant taught the early childhood development phase exclusively, and the remaining participants taught the intermediate phase, senior phase and vocational phase relatively equally distributed.

Procedures

Following ethics approval, data collection took place during staff meetings outside learner contact time. Principals allocated 10 min – 20 min for the researcher to

explain the study, ethical considerations and the survey completion process. Information letters and consent forms were distributed and collected at the meeting. The researcher was present to address questions and ensure clarity. Participants received a small refreshment pack (pen, chocolate, juice, thank-you note) and were reminded they could withdraw at any time without consequence. Surveys were completed in participants' own time and returned anonymously in sealed boxes collected a week later.

Data analysis

The data were entered into Excel and exported to SPSS version 29 for data analysis. Descriptive statistics were used to analyse biographic information and involved frequency distributions for categorical variables and measures of location (e.g. *M* and median [*Mdn*]) and measures of spread (e.g. *SD* and inter-quartile range [*IQR*]) for continuous variables.

Questions addressing the participants' own definitions (i.e. open-ended questions) were analysed using thematic qualitative analysis, with themes and subthemes identified and described. The other open-ended questions were analysed using qualitative content analysis, with the data coded, and then, frequency counts were performed to describe the data (Vaismoradi et al. 2016). Reliability and validity were established using Cronbach's alpha (reliability), an expert panel (content validity) and a pilot study (response validity), and it was found to be reliable and valid. The interested reader is referred to Human (2023) for details.

Response validity was obtained through the pilot study, in which special needs teachers, similar to the ones included in the main study, shared feedback to improve the clarity of questions and to ensure that questions were not open to misinterpretation or bias (Cobern & Adams 2020). Content validity was established through expert panel appraisal, a pilot study and by basing questions on theoretical concepts identified in the literature review (Cobern & Adams 2020).

Ethical considerations

The research was conducted following due ethical procedures and conventions. Ethics approval was granted by the Ethics Committee, Faculty of Humanities, University of Pretoria (Reference no: 15278175 Hum007/1022).

Results

The quantitative and qualitative results from the survey are presented according to the three sub-aims of the study. Quantitative findings reflect teachers' perceptions in relation to: (1) the value of literacy instruction for learners with ASD; (2) the nature of literacy instruction provided to learners with ASD and (3) the challenges affecting the success of such instruction. A 5-point Likert scale was used, where mean (*M)* values closer to 5 indicate responses of 'always' and values closer to 1 indicate responses of 'never' in relation to each construct. Qualitative findings are discussed and summarised in Table 2 and Table 3, with themes and sub-themes identified from teachers' definitions of literacy and digital literacy.

Teachers' perceptions on the value of literacy instruction for their learners with autism spectrum disorder

Most participants indicated that they value literacy 'frequently' (*M* = 4), without much variation in responses (*SD* = 0.8, *IQR* = 0.0), indicating that, across the board, participants find literacy important. Participants reported spending an average of 2.8 h (13.6 h per week) on direct literacy instruction during a typical 5.8-h school day. However, the time spent on literacy instruction varied greatly, ranging from 2.5 h to 36.5 h per week (*SD* = 5.2). Thirty-four per cent of participants indicated spending 4 to 6 h daily on literacy instruction. The lack of consistency in reported daily literacy instruction suggests that schools may have standardised curriculum requirements for literacy instruction time. Nearly half of the participants (48%) reported teaching literacy for most of the school day,

TABLE 2: Participants' own definition of literacy.

Themes	Subthemes	No. of comments	Verbatim examples of definitions mentioned
1. *Literacy is a vehicle for communication*	1.1. Literacy is a means of all modes of communication	22	• The ability to read and/or write using orthodox writing tools or technological devices/virtual tools. Reading is not restricted to words but also pictures, sign language, etc. Any form used to convey messages or meaning.
	1.2. Literacy is a means of speaking	14	• Being able to communicate with the world around you – making yourself heard – either using sign language or media – such as talking/speaking device or reading something for understanding – using voice, mind and body.
			• Ability and confidence to read and communicate and write in a particular language; however, it is not limited to one's ability to speak, even making use of PECS, SASL and Makaton in order to read and communicate.
			• Literacy is a way of communication using words. Also, you can send messages by writing, reading, listening and speaking, mostly in English.
2. *Literacy is the ability to read and write*	-	20	• Reading, writing, spelling, listening competency skills and language skills.
			• The ability to read, write and understand.
3. *Literacy is a means of processing visual information*	3.1. Literacy as a means of understanding images	4	• It is when you want to indicate writing with high quality. It means 'letters' as in letters of the alphabet. It means when you write something in a piece of work or even to read something.
	3.2. Literacy as an interaction with writing	2	• Understanding the world around you via reading, writing and understanding of images.
4. *Literacy is a dynamic and complex experience*	-	2	• Ability to read or write. Not all who read can write and not all who write can read fluently.
			• It is the ability to identify, understand, interpret, create, communicate and compute, using words, printed and written materials or auditory materials.

TABLE 3: Definition of digital literacy according to participants.

Themes	Subthemes	No. of comments	Verbatim examples of definitions mentioned
1. *Technology as a means of communication*	1.1. Communication through devices, as a means of AAC	17	• Digital literacy is children learning to communicate through Internet, social media, cell phones, etc.
	1.2. Communication through social media	5	• Digital literacy means having the skills you need to live, learn and work in the society where communication and access to information are increasing through digital technology and Internet.
			• Working on iPad and computer. They can express themselves better, with less frustration for learning.
			• Digital literacy is the ways that communication can take place in a digital format. This would be using digital platforms or digital devices.
2. *Technology as a means of educating*	2.1. Using technology to teach generally	12	• We use interactive boards to assist students with some concepts: I would describe that as digital. Any method where one makes use of an electronic device.
	2.2. Using technology to teach literacy	3	• Use of technology, e.g. iPads, for reading programmes for literacy. I also feel that the use of picture cards/visual schedules is a form of digital literacy.
3. *Developing literacy through technology*	-	11	• Literacy is like reading and writing that can be performed on a device, e.g. a cell phone or PC.
4. *Digital literacy as a means of learner engagement*	-	8	• Making use of technology in learning using devices – PCs to smartphones/iPads and tablets – as a tool to help social engagement and thinking.
			• New experience for learner – motivational. It provides broad visual and auditory stimulation. Parents want digital literacy for their child.
5. *Understanding how to use technology*	-	7	• The ability to use technology like laptops and computers.

AAC, augmentative and alternative communication.

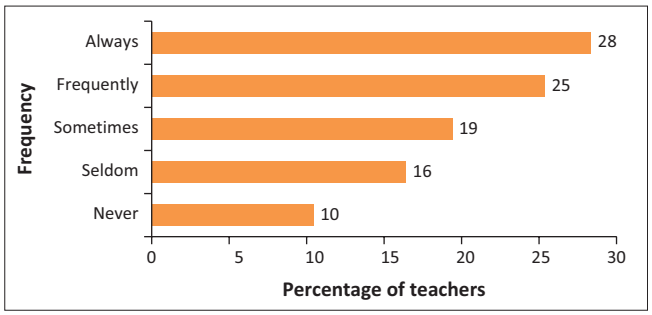


FIGURE 1: Frequency of using a functional curriculum.

reflecting its importance. Figure 1 shows the frequency of participants using a functional curriculum (i.e. a curriculum that excludes academic work).

Figure 1 shows that 28% of participants reported 'always' teaching a non-academic functional curriculum, indicating that LSEN public schools may not routinely include literacy instruction. Although participants value literacy generally, they feel that their learners are only capable of developing full literacy skills 'seldom' to 'sometimes' ($M = 2.6$). Over half of the participants (58%) perceived functional skills to be more valuable for learners with ASD than literacy skills. Participants also feel that their learners will develop only functional literacy skills (e.g. reading a menu) 'seldom' to 'sometimes' ($M = 2.9$) but develop a few functional literacy skills (e.g. identifying logos) slightly more frequently (i.e. 'sometimes' to 'frequently') ($M = 3.4$). This shows that participants generally did not believe their learners would develop any form of literacy skills, be it conventional or functional.

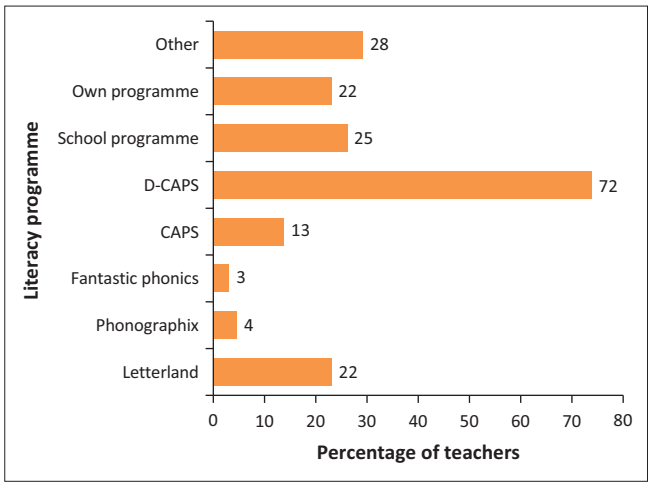
Participants did not provide consistent responses to whether they believe conventional literacy instruction is appropriate for their learners ($SD = 1.2$, $IQR = 2$); however, almost half of the participants (46%) leaned towards 'never' viewing conventional literacy instruction as appropriate for their learners with ASD.

Participants' responses to the open-ended question on defining literacy were collated into themes and sub-themes and are presented in Table 2. Four distinguishable themes were conceptualised, namely: (1) literacy is a vehicle for communication (36 comments), which indicates that South African teachers working with learners with ASD find that augmentative and alternative communication (AAC) and literacy are linked; (2) literacy is the ability to read and write (20 comments), which is a basic and limiting definition for learners with ASD; (3) literacy is a means of processing visual information (six comments), which indicates the importance of the visual learning environment in autism specific LSEN schools; and (4) literacy is a complex and dynamic experience (two comments), which alludes the interaction between reading and writing.

The nature of literacy instruction provided to learners with autism spectrum disorder

Figure 2 shows that most participants (72%) reported using the Differentiated Curriculum Assessment Policy Statement (D-CAPS) curriculum to inform their literacy objectives. Nearly half (47%) used alternative and informal literacy programmes, comprising school-made programmes (25%) or their own programmes (22%). The Letterland literacy programme, a traditional phonics-based reading programme, was used around one-fifth of the time (22%). Fantastic Phonics and Phonographix were used by 3% and 4%, respectively, while no participants reported that they made use of the RAVE-O (Retrieval, Automaticity, Vocabulary, Engagement – Orthography) literacy programme, despite it being a programme designed for readers with disabilities (Abendan et al. 2024). None of the participants mentioned any other formal literacy programmes. The 'other' programmes included AAC, visual aids, play, TEACCH (Treatment and Education of Autistic and Related Communication Handicapped Children) and technology.

Consistent with the hours spent on literacy instruction per day, participants also report that they provide literacy instruction to their learners with ASD 'sometimes' to



Note: The percentages in Figure 2 sum to 189%, as participants could select multiple literacy programmes.

D-CAPS, differentiated curriculum assessment policy statement; CAPS, curriculum assessment policy statement.

FIGURE 2: Literacy programme used by teachers.

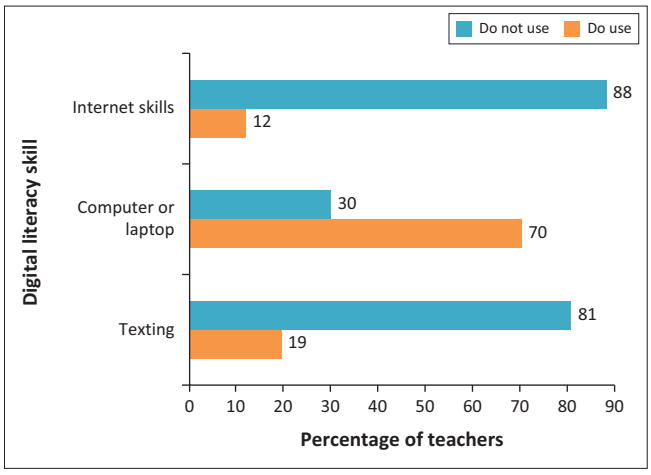


FIGURE 3: Device use by teachers to teach digital literacy skills.

'frequently' (M = 3.7, Mdn = 4). Participants reported primarily using informal approaches to literacy, with indirect literacy instruction occurring 'sometimes' to 'frequently' (M = 3.2) and reading and writing assessed informally (M = 3.6). Formal literacy instruction, such as standardised testing, was used less frequently ('seldom' to 'sometimes' (M = 2.3) with 40% of participants 'never' using this method. These results align with 48% of participants using informal literacy programmes to guide their objectives. Handwriting was incorporated 'sometimes' to 'frequently' (M = 3.3), whereas typing is only incorporated by participants 'seldom' to 'sometimes' (M = 2.4).

Autism spectrum disorder-specific instruction

Given the study's focus on autism-specific LSEN schools, it was expected that many participants would use literacy instruction suited for learners with ASD. Participants reported re-evaluating their literacy instruction methods to ensure positive outcomes in their learners with ASD, 'sometimes' to 'frequently' (M = 3.8, Mdn = 4). They also changed and adapted the curriculum regularly to ensure positive outcomes almost 'always' (M = 4.3) and created engaging material for their learners with ASD 'sometimes' to 'frequently' (M = 3.6). However, this response varied (SD = 1.1, IQR = 2), indicating that some participants were more successful in taking time out of their day to create literacy material than others. Participants tended to only build on language and understanding of concepts, 'sometimes' to 'frequently' (M = 3.4, Mdn = 3).

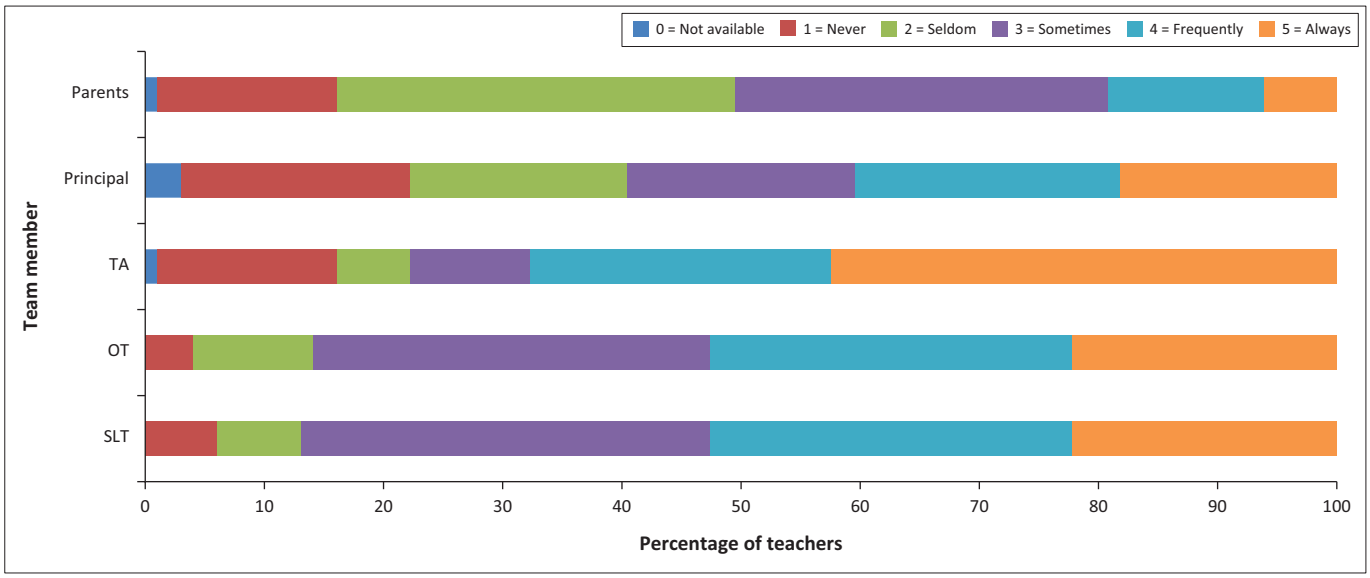
Digital literacy

Participants valued digital literacy (M = 3.7) slightly less than traditional literacy (M = 4). Nearly all participants (97%) have access to either a school-provided computer or their own. Figure 3 outlines the incorporation of digital literacy in the classroom. Most participants reported using their laptops to teach literacy skills (70%). Participants specifically mentioned using videos, pictures and themed discussions to teach literacy, teaching learners to run the Gemiini© programme (a programme that uses direct video modelling [DVM] to assist individuals with ASD develop speech) (Galvin 2024) and also teaching learners to use devices to develop their skills. Few teachers used cell phones and texting as a means of teaching digital literacy skills (19%) (mostly as a form of communication with parents, while one teacher indicated that she actively teaches learners how to text on a mobile device). Only 12% reported actively teaching Internet skills, such as conducting online research and communicating via Internet platforms.

To further unpack participants' understanding of digital literacy, participants were asked to share their own definitions of digital literacy, shown in Table 3. They provided a variety of definitions that were delineated into five themes. The largest group linked digital literacy to AAC, defining it as using devices for communication, reflecting how learners interact with technology. The second largest group viewed digital literacy as using technology for teaching, such as interactive smartboards. Eleven participants defined it as developing literacy through technology, while eight participants emphasised learner engagement. Seven participants focused on understanding how to use technology, and some also identified social media as a form of digital literacy.

Challenges in teaching literacy to learners with autism spectrum disorder

Figure 4 outlines the frequency of team support as viewed by participants. The 5-point Likert scale ranged from 1 = Never to 5 = Always. A 'not available' option was also provided. Participants stated that they 'sometimes' to 'frequently' (M = 3.4) feel supported by their team in teaching literacy to their learners with ASD. The team members whose participants felt the most consistently supported by were the teaching assistants (M = 3.8) and the speech-language therapists (SLT) and occupational therapists (OT) (M = 3.6). Team members whose participants felt the least supported by were the parents (M = 2.6), who supported the participants



OT, occupational therapists; SLT, speech-language therapists; TA, teaching assistants.

FIGURE 4: Frequency of team support rated by teachers.

'seldom' to 'sometimes', and the school principals (M = 3.0), who supported the participants 'sometimes'. Teaching assistants offered varying degrees of support (SD = 1.5, IQR = 2), with 33% of participants indicating that teaching assistants provide support 'never' to 'sometimes' and 67% of participants indicating that teaching assistants provide support 'frequently' to 'always'.

Multilingualism was identified by participants as one of the greatest barriers to literacy instruction they face, with 54% feeling this way 'frequently' to 'always' (M = 3.5). Another notable challenge faced by participants was the negative impact of learner behaviours on participants' ability to teach learners with ASD literacy 'sometimes' to 'frequently' (M = 3.3). Participants generally believed that learners with ASD are more difficult to teach than those with other delays, with responses ranging from 'sometimes' to 'frequently' (M = 3.2). Notably, 37% reported feeling this way 'frequently' to 'always'. Additionally, participants tended to feel that learners with ASD take too long to grasp concepts, which acts as a barrier to literacy learning, with responses ranging from 'sometimes' to 'frequently' (M = 3.3).

Participants 'seldom' to 'sometimes' felt that teaching literacy is disrupted when learners take a longer time with feeding, toileting and pull-out therapies (M = 2.4). They tended not to feel that their learners with ASD were too young to grasp literacy concepts, reporting that they only felt that way 'seldom' to 'sometimes' (M = 2.3).

When asking participants to describe the barriers they faced, the most common challenge mentioned was that parents do not work with teachers and do not carry over learning in the home environment (15%). This is consistent with participant reports that parents are a supportive team member only 'seldom' to 'sometimes' (M = 2.6). For participants to mention reduced parent support as a barrier indicates the value teachers hold for parents as team members when educating learners with ASD. Twelve per cent of participants believed that their learners were too low functioning to teach literacy, another 12% of participants felt that behaviour negatively impacted literacy learning and 12% of participants cited that the variability of ASD and individual needs are barriers to literacy instruction. One participant explained:

> 'Not all ASD learners are the same. Some are teachable and others less so. It is not fair to learners to be seen as the same, just because of their ASD diagnosis. Some learners will learn literacy skills easily and others won't learn it at all. They are all unique and special.' (47-year-old, female, teacher)

Some barriers to teaching digital literacy skills to learners with ASD included the belief by 43% of participants that learners are not capable of developing Internet skills or computer skills (e.g. 'It is too abstract for my learners as they are high support learners'), while 12% felt that Internet skills were not included in their curriculum. Participants also held the belief that learners are too young to be taught texting skills (despite most participants teaching the foundation phase). External barriers, such as learners' lack of resources (e.g. no smartphones to develop texting skills) and limited resources for participants (e.g. laptops for individual use, lack of Internet connectivity at the school and insufficient digital resources for all learners), were also mentioned.

Some participants felt that reading and writing fluently was a prerequisite for exposure to the use of a cell phone. One participant explained:

> 'The learners are not yet able to spell words accurately. They are moderate to high support needs.' (60-year-old, female, teacher)

Some participants also stated that the level of support learners need precludes them from the education or the use of technology:

> 'I teach a high support class, so they are not capable of using a computer.' (51-year-old, female, teacher)

Internet skills were also described as not being a feasible skill for their learners.

Discussion

Teachers in LSEN schools are tasked to provide quality education, including literacy instruction, to all learners. Literacy is a vital skill that enables all learners to enter adulthood with access to employment, social interaction and participation in activities of daily living (DoE 2001; Ruppar, Gaffney & Dymond 2015).

Teachers' perceptions on the value of literacy instruction for learners with autism spectrum disorder

Results showed that teachers highly value literacy and spend most of the academic day teaching literacy skills. However, their responses on how much they value literacy for their learners with ASD and whether they incorporate literacy instruction in day-to-day education were inconsistent.

On average, the 13.6 h spent on direct literacy instruction per week aligns with the expectations of the National Reading Strategy, which recommends 10 h of literacy instruction per week for the foundation phase (DoE 2008). However, over a third of teachers provided unrealistic responses regarding the time they spend on direct literacy instruction, with inflated hours up to 36.5 h per week, which likely skewed the average. This may reflect socially desirable responding on the part of teachers, potentially because of the *Hawthorne* effect – a research phenomenon in which participants' awareness of being studied influences their behaviours. In this context, teachers may have felt compelled to provide inflated responses to convey that they engaged in continuous literacy construction (Berkhout et al. 2022). This may suggest that teachers have a limited understanding of how to effectively teach literacy to learners with extensive support needs, for example, through strategies that promote engagement or incorporate play-based learning. However, it is also possible that teachers integrate literacy into daily routines such as mealtimes, toileting and play, which may account for their elevated self-reported responses.

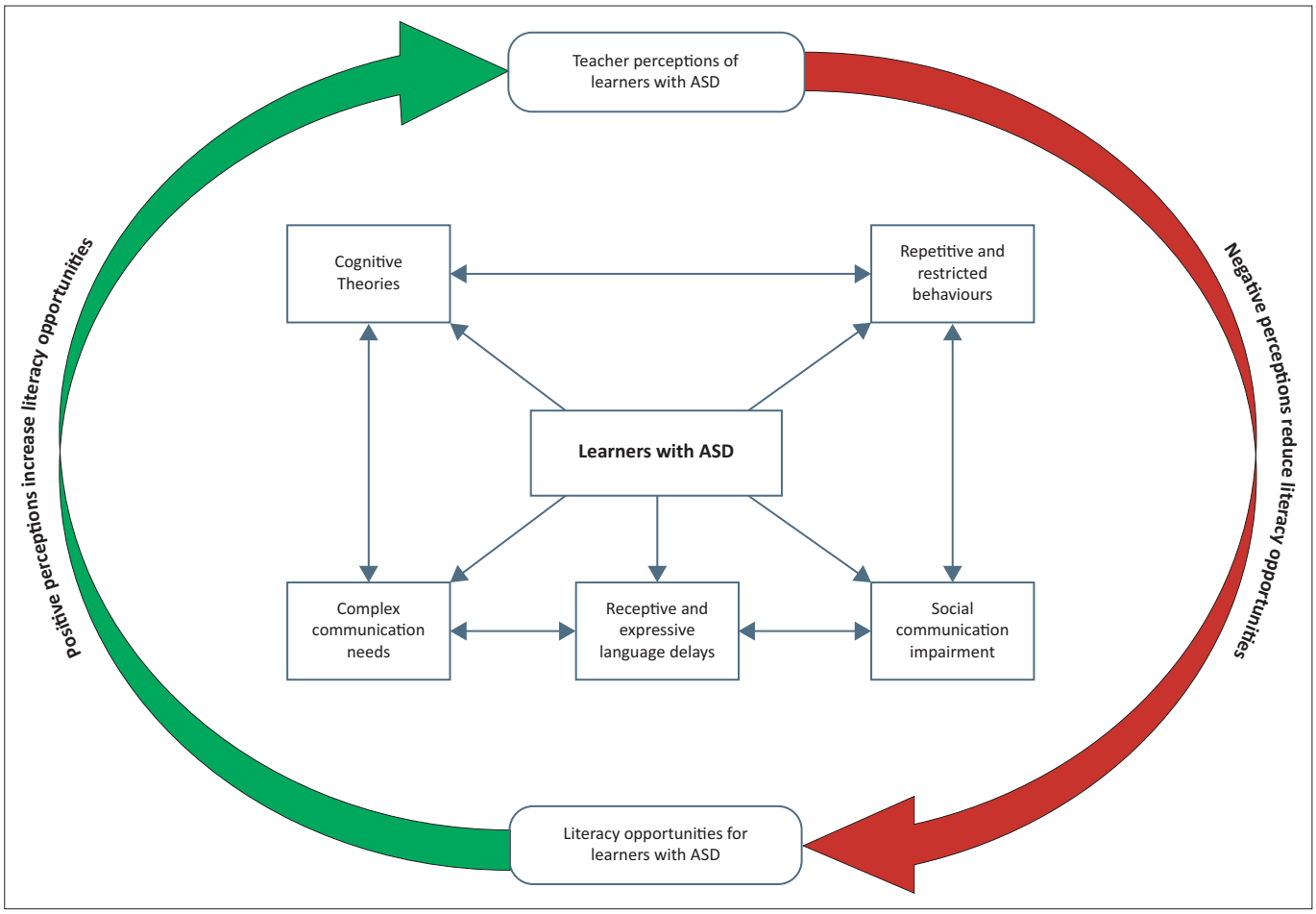
A strong emphasis on literacy should result in its integration into learners' contact time (Rimmer, Dahary & Quintin 2022), yet most teachers in this study prefer using a functional curriculum over an academic one. Additionally, most teachers viewed functional skills as more valuable to their learners than academic literacy instruction. This ties into the findings by Bornman (2017) that South African teachers in the LSEN setting tend to prioritise care over providing literacy instruction with attainable goals. A functional curriculum that lacks academic literacy instruction is detrimental to the learning and potential of learners with disabilities, particularly those with ASD (Clendon et al. 2021). The limiting belief that learners with ASD are incapable of developing academic skills impacts their exposure to various literacy materials and could have negative consequences for their access to employment, particularly if reading and writing skills are not adequately supported.

Teachers' expectations influence their goal setting and the effort they use to assist the learners in achieving these goals (Cobos-Sanchiz et al. 2022). This study indicates that teachers in LSEN schools could have negative views of their learners' abilities to develop literacy skills, which negatively impact the effort and quality of the literacy instruction they provide in a vicious cycle, as per the *Pygmalion effect* (Rosenthal & Jacobson 1968).

Keefe and Copeland (2011) suggested that a definition of literacy provided by teachers can provide a glimpse into how they conceptualise literacy, which in turn could impact how they provide literacy instruction for learners with support needs. In fact, a definition shapes a teacher's understanding of where they place their learners on the binary 'non-literate' to 'literate' scale (Keefe & Copeland 2011:93), thus affecting their classroom instruction and opportunities they offer to develop literacy for those learners with support needs. Teachers in this study mostly defined literacy as a means of communication. They also described literacy as a tool for communication, including aided forms such as devices and unaided forms such as sign language. This is significant for learners with ASD with limited speech, as literacy affords them opportunities to communicate in a conventional manner across settings (Clendon et al. 2021).

Many teachers also describe literacy in a simplistic manner, namely, as merely the ability to read, write and understand, in line with Keefe and Copeland's (2011) 'narrow definition of literacy' (p. 96), which typically results in low expectations or limited opportunities. As illustrated in Figure 5, the complex nature of literacy development in learners with ASD underscores how narrow teacher definitions of literacy risk limit the support provided. Moreover, a narrow definition does not acknowledge the strengths of learners with ASD, such as heightened visual learning skills (Tissot & Evans 2003). This links to teachers defining literacy as a means of processing visual information, including literacy as a means of understanding images. This indicates that the pedagogy of visual learning (i.e. Picture Exchange Communication System (PECS), Makaton, TEACCH, visual aids, etc.), which autism-specific LSEN schools tend to use, has influenced how some teachers view the literacy development of their learners.

Teachers also mentioned that literacy is a dynamic and complex experience, tying into the heterogeneity of ASD and the notion of meaningful literacy that highlights literacy as dynamic, unique and taking on many forms (Adams 2024; Keefe & Copeland 2011).



ASD, autism spectrum disorder.

FIGURE 5: Theoretical model outlining the interaction between intrinsic and extrinsic factors that influence literacy development in learners with ASD.

The nature of literacy instruction provided to learners with autism spectrum disorder

Most teachers use the D-Caps (DBE 2018) which is designed to accommodate the various support needs of learners, including those with ASD, and provides adjusted goals for learners while also promoting the use of an Individualised Support Plan (ISP) (DBE 2014). The D-CAPS does not, however, supply a literacy programme for teachers to use.

Half of the teachers in this study used informal literacy programmes. Many teachers indicated the use of AAC such as Makaton, play, visual aids, TEACCH and technology as tools for literacy instruction. For learners with ASD to be meaningfully engaged in literacy instruction, teachers need to incorporate a variety of strategies that increase access to literacy opportunities (Caron, Light & McNaughton 2021). These strategies include playful engagement with diverse materials, the use of technology and the integration of visual aids and visual schedules. Similarly, Liswaniso (2023) found that effective reading instruction entails dynamic and flexible teaching, which is tailored to the different individual needs and abilities of the learner across classroom contexts. Therefore, informal literacy programmes can be effective when using strategies that boost the engagement of learners, which teachers in this study incorporate into their literacy instruction.

Approximately a quarter of teachers used Letterland as their literacy programme for their learners with ASD. This phonics-based programme relies on learners being able to speak and uses auditory perceptual skills and phonological awareness skills to make sound–letter associations (Roberts & Smolkowski 2025). For learners with ASD, the abstract nature of the fusion of characters and letters could be difficult to conceptualise (Hall 2023). One teacher in this study mentioned, 'Even though I use Letterland, they don't build words phonetically'. This challenge is possibly linked to the fact that Letterland requires learners to speak, which means it is not necessarily suitable for learners with ASD and limited speech.

In terms of creating written work, teachers focused more on handwriting than on typing skills. Handwriting is an important skill to work on as learners with ASD tend to have weak fine motor skills (Talkar et al. 2020). However, the option of typing as a source of developing literacy skills and linking it to technology as evidence-based practice for educating learners with ASD is a factor to consider (Hume et al. 2021). Despite most teachers reporting to use a functional curriculum, they stated that they 'seldom' incorporate typing

skills into written work. This suggests that teachers do not include typing as part of the functional curriculum, which could be owing to a lack of resources or negative attitudes towards the use of technology.

Teachers also shared that they tended to build on language and understanding 'sometimes'. Language as a component of literacy is well supported by research (Beukelman & Light 2020; McIntyre et al. 2021; Tárraga-Mínguez et al. 2020). For learners with ASD specifically, language has been found to be a crucial element in their difficulty with reading comprehension (Whalon & Hart 2011).

Digital literacy skills were valued by teachers, however, less so than traditional literacy. Most teachers did not use cell phones or Internet skills as platforms for digital literacy instruction. Digital literacy instruction mostly involved using laptops (almost all teachers had access to a laptop) to teach literacy concepts using videos, pictures and themed discussions. This ties into the idea that digital literacy is learning literacy through the use of technology, which was a theme that was garnered from teacher definitions. Computer-based literacy instruction, which uses visual presentations via digital platforms, allows teachers to create dynamic and customisable learning environments (Ali Eissa Saad 2022). A key advantage is the reduction of social interaction demands, which benefits learners with ASD who often experience difficulties in this area. By minimising the need for direct teacher–learner interactions during reading comprehension, computer-based literacy instruction has been linked to positive outcomes, including increased learning rates, improved attention and behaviour, enhanced ability to answer wh-questions, better symbol and text understanding, and gains in receptive vocabulary (Macdonald, Luk & Quintin 2022). These findings highlight the potential of computer-based instruction to support literacy development in learners with ASD.

Only two teachers (3%) reported using a laptop to assist learners in developing their own digital literacy skills (i.e. using a computer, navigating the applications, controlling a mouse and typing on a keyboard). Therefore, teachers mainly incorporate digital literacy by teaching literacy through digital platforms (laptops, computers or smartboards). In the past, technology was primarily used as a tool for delivering interventions, such as presenting videos or prompting learners. More recently, however, contemporary teaching practices increasingly incorporate video modelling, which allows learners to observe themselves or others performing a task through video (Drill & Bellini 2022). This approach has shown positive effects on literacy comprehension and should therefore be encouraged in South African classrooms.

Nearly a third of teachers viewed digital literacy as the use of technology to educate (mostly general education, with a few teachers indicating using technology to teach literacy skills). Teachers also described digital literacy as reading and writing on a digital platform (i.e. reading a text on a screen).

Only 10% of teachers viewed digital literacy as understanding how to use technology. This ties into Gilster's (1997) seminal definition of digital literacy as the ability to understand and use information when presented via computers. Given that only a limited number of teachers use this definition, it is likely that teachers in LSEN schools do not have a clear understanding of digital literacy, which in turn impacts their digital literacy instruction.

Overall, this study showed that teachers use a mix of methods to teach literacy skills to their learners, with some methods being more conducive for their learners with ASD than others. It is evident that there is some form of digital literacy instruction in LSEN schools; however, this is often limited to using devices to present lessons, rather than teaching learners how to use devices.

The challenges teachers feel they face in teaching literacy to learners with autism spectrum disorder

Poor collaborative support by the team at special needs schools can act as a barrier to success for learners (Bornman 2017). Teachers in this study reported that they generally felt supported by their team, particularly by the teaching assistants in their classrooms, followed by OTs and SLTs. However, they reported feeling less supported by their principals in line with global school research, where teachers often felt they preferred the learning support of teaching assistants over administrative heads such as principals (Mangano 2015). Consistent with local research, Sumbane et al. (2023) found that many South African teachers perceive senior management as unsupportive of the challenges they face when teaching learners with ASD. Of all the team members, teachers felt the least supported by the parents. This is not surprising, as Bornman (2017) reported that parents feel that literacy is the role of the teacher and a skill that can only be taught in a school.

Language and literacy have a reciprocal link, and in South Africa, with its multilingual population, the language of learning and teaching (LoLT) does not always match the learner's home language. Most teachers felt that multilingualism was 'frequently' to 'always' a barrier to literacy instruction. Despite this, they reported only building on language concepts and understanding 'sometimes' to 'frequently'. Given the intrinsic factor of language delays seen in learners with ASD (Whalon & Hart 2011) and the factor of multilingualism in the classroom (Kathard et al. 2011), establishing a focused approach to language instruction from the earliest grades is fundamental to literacy development in learners with ASD (Whalon & Hart 2011).

Teachers tended to feel that learner behaviour had a negative impact on their literacy development. Research has shown that teachers who perceive the behaviour of learners with ASD as challenging often invest significant time and energy in rigidly structured routines aimed at managing that behaviour (Sleiman et al. 2020). In contrast, teachers who do

not view behaviour as a primary challenge with learners with ASD tend to adopt more flexible instructional approaches, creating multiple avenues for classroom participation and actively engaging learners.

In this study, teachers perceived teaching learners with ASD as being more difficult compared to teaching learners with other delays. This could be owing to the fact that learners with ASD present with challenging behaviour as a feature of their diagnosis (Sleiman et al. 2020). Additionally, with most of the learners with limited speech, research has found that teachers in South Africa have a negative perception towards those with severe speech impairments in contrast to other delays (Bornman & Donohue 2013).

A small number of teachers stated that learners with ASD are 'too low functioning' to learn literacy. Similarly, Engelbrecht et al. (2015) found, in a qualitative study, that teachers in mainstream settings in South Africa have a medical deficit approach to teaching and learning, resulting in them viewing barriers to learning as internal to the learner with disability. This study suggests that some teachers in LSEN schools generally hold negative perceptions of the literacy development of learners with ASD, perceptions likely shaped by a postcolonial biomedical model of disability, which emphasises a deficit-based approach (Pillay & Kathard 2018). This stands in stark contrast to existing literature, which has demonstrated that individuals with ASD who require more intensive support can – and do – develop literacy skills (Rimmer et al. 2022). Moreover, literacy is recognised as a fundamental human right and is central to the 'activity and participation' components of the International Classification of Functioning, Disability and Health (ICF) (Sulaiman et al. 2021; UNESCO 2017). Given that some teachers reported that learners 'take too long to grasp concepts', greater emphasis should be placed on literacy development through modelling, repetition and sustained engagement (Bornman 2017). However, learners tend to live up to the expectations of what is expected of them – the *Rosenthal effect* as discussed earlier (Szumski & Karwowski 2019). Therefore, teachers who hold negative perceptions towards their learners with ASD act as a barrier to literacy development, as opposed to the learners' 'level of functioning' as mentioned by a few teachers.

Teachers described a range of barriers to digital literacy instruction, with learners being incapable of using devices (laptops, cell phones or the Internet) mentioned most frequently. Once again, teachers tend to hold negative perceptions towards the abilities of their learners, despite research indicating that not only can individuals with disability develop digital literacy skills (Cihak et al. 2015) but that encouraging the use of technology engages learners with ASD (Walker et al. 2023) and links into their strengths in visual learning (Tissot & Evans 2003). Furthermore, Sumbane et al. (2023) argued that resources for learners with ASD in South African LSEN schools should include e-learning facilities and personal devices for all learners, including AAC and other assistive technologies. This was not the case in LSEN schools in Gauteng, where only one teacher in this study reported using a cell phone to teach digital literacy skills. Notably, several teachers expressed circular reasoning, arguing that because learners could not read or write, there was no justification for teaching these skills through texting. Therefore, a negative attitude towards the use of devices as part of digital literacy instruction would mean that learners are not receiving essential resources for developing their literacy skills. This also ties into the *narrative of pessimism* (Keefe & Copeland 2011) where teachers hold a self-fulfilling prophecy that learners with ASD requiring more intensive support cannot acquire digital literacy skills and thus are not afforded the opportunity for digital literacy instruction. This contrasts with findings in the literature (Cihak et al. 2015, Walker et al. 2023), which suggests that digital literacy aligns with a strength-based approach to teaching learners with ASD, particularly by drawing on their visual learning preferences. The consequences of this, in the 21st century, are that learners with ASD who are part of the digitally native generation are missing out on an essential part of how to function independently in today's society (Cihak et al. 2015).

Limitations

Some responses clearly showed socially desirable answers, which might be owing to the presence of the researcher and the presence of their colleagues when they completed the surveys, despite being assured of confidentiality. Non-random purposive sampling limits the generalisability of the findings to a broader population. Moreover, this study focused on teachers from LSEN schools in the Gauteng province, an urban area that is relatively better resourced than many rural regions of South Africa. However, despite these relative advantages, teachers still reported substantial challenges. Therefore, the findings may not be generalisable to LSEN teachers nationally and may, in fact, understate the difficulties experienced in more under-resourced contexts.

Implications for practice

This study highlights the urgent need to prioritise literacy in LSEN schools and include them in national literacy improvement efforts. Teachers' negative perceptions of learners with ASD can the need for district-level hinder progress, underscoring training to shift attitudes and promote digital literacy. Ongoing professional development should focus on presuming competence and using available tech tools, with support from tech partners and evidence-based training (such as the use of the RAVE-O programme, rather than Letterland). Parental involvement plays a critical role in literacy development; future studies should explore parents' perceptions of their role in literacy instruction, particularly within LSEN schools. Such research could shed light on possible differences in expectations between parents and teachers and inform strategies to build stronger home–school partnerships. Schools should provide training and actively promote parent engagement,

recognising parents as experts on their own children. While SLTs and OTs are valued, they need to provide more frequent, expert support, especially in curriculum and ISP development. Teaching assistants could be trained to better support literacy and digital tools.

Conclusion

This study found that teachers value literacy and prioritise functional skills over conventional literacy for learners with ASD. They often doubt their learners' ability to master literacy skills. Many teachers defined literacy as a means of communication, or simply as the ability to read and write, with some viewing it as a dynamic experience and others highlighting the visual strength of learners with ASD.

Most teachers did not actively instruct digital literacy skills in their learners with ASD, but those who did used laptops as an intervention delivery system (e.g. using videos and pictures). Teachers defined digital literacy differently, with most viewing it as a means of communication and some as a means of education. Few teachers viewed digital literacy as the ability to use technology. The most frequently mentioned barrier was teachers' belief that their learners are incapable of using devices.

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Competing interests

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Authors' contributions

H.J.W.H. and J.B. were involved in the conceptualisation, investigation, resources, methodology, data curation and writing (original draft and preparation). M.A.G. performed formal analysis and was responsible for visualisation. H.J.W.H., M.A.G. and J.B. were involved in writing, reviewing and editing. J.B. was involved in supervision. All authors have approved the submission of the manuscript.

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Data availability

The data that support the results of the study are available upon reasonable request from the first author, H.J.W.H. The data are not publicly available in accordance with ethics requirements as they contain information that could compromise the privacy of the research participants.

Disclaimer

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References

Abendan, C.F., Canubas, A.L., Canoy, C., Cuizon, J., Rebecoy, W. & Kilag, O.K., 2024, 'Enhancing literal reading skills in elementary pupils: A Rave-O strategy approach', *International Multidisciplinary Journal of Research for Innovation, Sustainability, and Excellence* 1(3), 284–291, viewed 28 June 2025, from https://risejournals.org/index.php/imjrise/article/view/361.

Adams, A.L., 2024, 'Visual literacy', *Public Services Quarterly* 20(4), 306–311. https://doi.org/10.1080/15228959.2024.2405704

Ainsworth, M.K., Evmenova, A.S., Behrmann, M. & Jerome, M., 2016, 'Teaching phonics to groups of middle school students with autism, intellectual disabilities, and complex communication needs', *Research in Developmental Disabilities* 56, 165–176. https://doi.org/10.1016/j.ridd.2016.06.001

Ali Eissa Saad, M., 2022, 'Reading comprehension and literacy instruction for students with autism spectrum disorder', *Technion Social Sciences Journal* 38(1), 151–159. https://doi.org/10.47577/tssj.v38i1.7941

American Psychiatric Association, 2013, *Diagnostic and statistical manual of mental disorders*, 5th edn., American Psychiatric Association, Washington, DC.

Berkhout, C., Berbra, O., Favre, J., Collins, C., Calafiore, M., Peremans, L. et al., 2022, 'Defining and evaluating the Hawthorne effect in primary care, a systematic review and meta-analysis', *Frontiers in Medicine* 9, 1033486. https://doi.org/10.3389/fmed.2022.1033486

Beukelman, D.R. & Light, J.C., 2020, *Augmentative and alternative communication: Supporting children and adults with complex communication needs*, 5th edn., Paul H. Brookes Publishing Co., Inc., Baltimore.

Bornman, J., 2017, 'Developing inclusive literacy practices in South African schools', in M. Milton (ed.), *International perspectives on inclusive education,* pp. 105–122, Emerald Publishing Limited, Leeds.

Bornman, J. & Donohue, D.K., 2013, 'South African teachers' attitudes toward learners with barriers to learning: Attention-deficit and hyperactivity disorder and little or no functional speech', *International Journal of Disability, Development and Education* 60(2), 85–104. https://doi.org/10.1080/1034912X.2013.786554

Cihak, D.F., Wright, R., Smith, C.C., McMahon, D. & Kraiss, K., 2015, 'Incorporating functional digital literacy skills as part of the curriculum for high school students with intellectual disability', *Education and Training in Autism and Developmental Disabilities* 50(2), 155–171.

Clendon, S., Paynter, J., Walker, S., Bowen, R. & Westerveld, M.F., 2021, 'Emergent literacy assessment in children with autism spectrum disorder who have limited verbal communication skills: A tutorial', *Language, Speech, and Hearing Services in Schools* 52(1), 165–180. https://doi.org/10.1044/2020_LSHSS-20-00030

Cobern, W. & Adams, B., 2020, 'Establishing survey validity: A practical guide', *International Journal of Assessment Tools in Education* 7(3), 404–419. https://doi.org/10.21449/ijate.781366

Cobos-Sanchiz, D., Perea-Rodriguez, M.J., Morón-Marchena, J.A. & Muñoz-Díaz, M.C., 2022, 'Positive adult education, learned helplessness and the Pygmalion effect', *International Journal of Environmental Research and Public Health* 19(2), 778. https://doi.org/10.3390/ijerph19020778

Caron, J., Light, J. & McNaughton, D., 2021, 'Effects of a literacy feature in an augmentative and alternative communication app on single word reading of individuals with severe autism spectrum disorders', *Research Practices for Persons with Severe Disabilities* 46(1), 18–34. https://doi.org/10.1177/1540796921992123

Department of Basic Education, 2010, *Guidelines for full service/inclusive schools, 2010*, Department of Basic Education, Pretoria.

Department of Basic Education, 2014, *Guidelines to ensure quality education and support in special schools and special school resource centres*, Department of Education Directorate Inclusive Education, viewed 20 May 2022, from https://www.education.gov.za/Portals/0/DoE%20Branches/GET/GET%20Schools/National_Reading.pdf?ver.

Department of Basic Education, 2018, *Differentiated national curriculum on assessment policy statement*, Department of Basic Education, Pretoria.

Department of Education, 2001, *Education White Paper 6 on special needs education: Building an inclusive education and training system*, Department of Education, Pretoria.

Department of Education, 2004, *White Paper on e-Education (26734)*, Department of Education, Pretoria.

Department of Education, 2008, *National reading strategy*, Department of Education, viewed 20 May 2022, from https://www.education.gov.za/Portals/0/Documents/Publications/SID%20DOCS/CAPS%20SID%20Section%201%20%204%20curriculum%20%20(2).pdf?ver=2018-06-15-094922-750.

Drill, R.B. & Bellini, S., 2022, 'Combining readers theatre, story mapping and video self-modelling interventions to improve narrative reading comprehension in children with autism spectrum disorder', *Journal of Autism and Developmental Disorders* 52(1), 1–15. https://doi.org/10.1007/s10803-021-04908-x

Donohue, D.K. & Bornman, J., 2023, 'Twenty years later: Has inclusive education in South Africa been realised?', in E.J. Done & H. Knowler (eds.), *International perspectives on exclusionary pressures in education*, ch. 10, pp. 205–215, Palgrave Macmillan, London.

Engelbrecht, P., Nel, M., Nel, N. & Tlale, D., 2015, 'Enacting understanding of inclusion in complex contexts: Classroom practices of South African teachers', *South African Journal of Education* 35(3), 1–10. https://doi.org/10.15700/saje.v35n3a1074

Finnegan, E.G., 2019, 'Literacy instruction for students with autism spectrum disorder in inclusive settings', *DADD Online* 6(1), 72–88.

Flanagan, S. & Shoffner, M., 2013, 'Technology: Secondary English teachers and classroom technology use', *Contemporary Issues in Technology and Teacher Education* 13(3), viewed 23 July 2023, from https://citejournal.org/volume-13/issue-3-13/general/teaching-without-technology-secondary-english-teachers-and-classroom-technology-use.

Galvin, M.A., 2024, 'The effects of the video modelling product Gemiini© on verbal response production of individuals with autism spectrum disorder who are nonspeaking or minimally speaking', Unpublished PhD Dissertation, University of South Dakota, viewed 27 June 2025, from https://red.library.usd.edu/diss-thesis.

Gilster, P., 1997, *Digital literacy*, Wiley Computer Pub., Hoboken, NJ.

Gómez-Marí, I., Sanz-Cervera, P. & Tárraga-Mínguez, R., 2022, 'Teachers' attitudes toward autism spectrum disorder: A systematic review', *Education Sciences* 12(2), 138. https://doi.org/10.3390/educsci12020138

Hall, S., 2023, 'Literacy instruction for students with autism spectrum disorder', Unpublished Master's thesis, Concordia University, viewed 28 June 2025, from https://digitalcommons.csp.edu/teacher-education_masters/85/.

Human, H., 2023, '*Teacher perceptions of literacy instruction for their learners with autism spectrum disorder'*, Unpublished Master's thesis, University of Pretoria, viewed 30 April 2025, from https://repository.up.ac.za/items/39b7a756-a20b-458b-8218-1631650f7478.

Hume, K., Steinbrenner, J.R., Odom, S.L., Morin, K.L., Nowell, S.W., Tomaszewski, B. et al., 2021, 'Evidence-based practices for children, youth, and young adults with autism: Third generation review', *Journal of Autism and Developmental Disorders* 51(11), 4013–4032. https://doi.org/10.1007/s10803-020-04844-2

Kagohara, D.M., Van Der Meer, L., Ramdoss, S., O'Reilly, M.F., Lancioni, G.E., Davis, T.N. et al., 2013, 'Using iPods® and iPads® in teaching programs for individuals with developmental disabilities: A systematic review', *Research in Developmental Disabilities* 34(1), 147–156. https://doi.org/10.1016/j.ridd.2012.07.027

Kathard, H., Ramma, L., Pascoe, M., Jordaan, H., Moonsamy, S., Wium, A.-M. et al., 2011, 'How can speech-language therapists and audiologists enhance language and literacy outcomes in South Africa? (And why we urgently need to)', *South African Journal of Communication Disorders* 58(2), 59. https://doi.org/10.4102/sajcd.v58i2.27

Keefe, E.B. & Copeland, S.R., 2011, 'What is literacy? The power of a definition', *Research and Practice for Persons with Severe Disabilities* 36(3–4), 92–99. https://doi.org/10.2511/027494811800824507

Kliewer, C., 2008, *Seeing all kids as readers: A new vision for literacy in the inclusive early childhood classroom*, Paul H. Brookes Pub., Baltimore.

Lecheler, M., Lasser, J., Vaughan, P.W., Leal, J., Ordetx, K. & Bischofberger, M., 2020, 'A matter of perspective: An exploratory study of a theory of mind autism intervention for adolescents', *Psychological Reports* 124(1), 39–53. https://doi.org/10.1177/0033294119898120

Liswaniso, B., 2023, '"Failing to progress" or not being supported to make progress? Examining variability in reading', *South African Journal of Childhood Education* 13(1), a1315. https://doi.org/10.4102/sajce.v13i1.1315

Macdonald, D., Luk, G. & Quintin, E.M., 2022, 'Early reading comprehension intervention for preschoolers with autism spectrum disorder and hyperlexia', *Journal of Autism and Developmental Disorders* 52, 1652–1672. https://doi.org/10.1007/s10803-021-05057-x

Macoun, S.J., Bedir, B. & Sheehan, J., 2022, 'Autism across the ages: An abbreviated history', in J.A. Matson & P. Sturmey (eds.), *Handbook of autism and pervasive developmental disorder: Assessment, diagnosis, and treatment*, pp. 579–598, Springer, Cham.

Mangano, M., 2015, 'Teacher views on working with others to promote inclusion', in D. Chambers (ed.), *International perspectives on inclusive education*, vol. 4, pp. 117–132, Emerald Group Publishing Limited, Leeds.

McDermott, M.K., 2025, 'Teachers' experiences implementing reading comprehension strategies with students with autism spectrum disorder: A phenomenology study', Unpublished PhD study, Liberty University, viewed 20 May 2022, from https://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=7942&context=doctoral.

McIntyre, N.S., Tomaszewski, B., Hume, K.A. & Odom, S.L., 2021, 'Stability of literacy profiles of adolescents with autism spectrum disorder and associations with stakeholder perceptions of appropriate high school support needs', *Language, Speech, and Hearing Services in Schools* 52(1), 209–224. https://doi.org/10.1044/2020_LSHSS-20-00016

Medina, A.L., Hancock, S.D., Hathaway, J.I., Pilonieta, P. & Holshouser, K.O., 2021, 'The influence of sustained, school-based professional development on explicit reading comprehension strategy instruction', *Reading Psychology* 42(8), 807–835. https://doi.org/10.1080/02702711.2021.1939820

Morin, K.H., 2023, 'Clarifying the importance of pilot studies', *Journal of Nursing Education* 62(9), 487–488. https://doi.org/10.3928/01484834-20230712-03

Nthibeli, M., Griffiths, D. & Bekker, T., 2022, 'Teaching learners with autism in the South African inclusive classroom: Pedagogic strategies and possibilities', *African Journal of Disability* 11(1), 979–991. https://doi.org/10.4102/ajod.v11i0.979

Omair, A., 2015, 'Selecting the appropriate study design for your research: Descriptive study designs', *Journal of Health Specialties* 3(3), 153–156. https://doi.org/10.4103/1658-600X.159892

Peng, P., Zhang, Z., Wang, W., Lee, K., Wang, T., Wang, C. et al., 2022, 'A meta-analytic review of cognition and reading difficulties: Individual differences, moderation, and language mediation mechanisms', *Psychological Bulletin* 148(3–4), 227. https://doi.org/10.1037/bul0000361

Pillay, M. & Kathard, H., 2018, 'Renewing our cultural borderlands: Equitable population innovations for communication (EPIC)', *Topics in Language Disorders* 38(2), 143–160. https://doi.org/10.1097/TLD.0000000000000151

Riga, A., Ioannidi, V. & Papauiannis, N., 2021, 'Social stories and digital literacy practices for inclusive education', *European Journal of Special Education Research* 7(2), 119–141. https://doi.org/10.46827/ejse.v7i2.3773

Rimmer, C., Dahary, H. & Quintin, E-M., 2022, 'Emergent literacy skills and autism: A scoping review of intervention programs', *Research in Autism Spectrum Disorders* 97, 102004. https://doi.org/10.1016/j.rasd.2022.102004

Roberts, T.A. & Smolkowski, K., 2025, 'Positive effects of the Letterland curriculum on kindergarteners' word reading skills and engagement behaviors: A comparison of two programs', *Journal of Educational Research* 118(4), 1–14. https://doi.org/10.1080/00220671.2025.2496313

Rombouts, E., Maes, B. & Zink, I., 2017, 'Beliefs and habits: Staff experiences with key word signing in special schools and group residential homes', *Augmentative and Alternative Communication* 33(2), 87–96. https://doi.org/10.1080/07434618.2017.1301550

Rosenthal, R. & Jacobson, L.F., 1968, 'Teacher expectations for the disadvantaged', *Scientific American* 218(4), 19–23. https://doi.org/10.1038/scientificamerican0468-19

Ruppar, A.L., Gaffney, J.S. & Dymond, S.K., 2015, 'Influences on teachers' decisions about literacy for secondary students with severe disabilities', *Exceptional Children* 81(2), 209–226. https://doi.org/10.1177/0014402914551739

Sefotho, M.M. & Onyishi, C., 2021, 'In-school transition challenges among primary school learners with autism spectrum disorders in South Africa: Parents and teachers' perspectives', *Perspectives in Education* 39(2), 283–302. https://doi.org/10.18820/2519593X/pie.v39.i2.20

Sleiman, A.A., Betz, A.M., Rey, C.N. & Blackman, A.L., 2020, 'Effects of token manipulation on responding within a token economy implemented with children with autism', *Education and Treatment of Children* 43(4), 323–333. https://doi.org/10.1007/s43494-020-00014-2

Sulaiman, S.K., Mohammad, A.H., Ibrahim, A.A., Abdu, S.I. & Kaka, B., 2021, 'Revisiting the international classification of functioning, disability and health, a comprehensive model for exploring disablement in low- and middle-income countries: A narrative overview', *Iranian Rehabilitation Journal* 19(3), 261–272. https://doi.org/10.32598/irj.19.3.1362.1

Sumbane, G.O., Mothiba, T.M., Modula, M.J., Mutshatshi, T.E. & Manamela, L.E., 2023, 'The McKinsey's 7-S Model Framework for assessment of challenges faced by teachers of children with autism spectrum disorders in the Limpopo Province, South Africa', *South African Journal of Childhood Education* 13(1), a1129. https://doi.org/10.4102/sajce.v13i1.1129

Szumski, G. & Karwowski, M., 2019, 'Exploring the Pygmalion effect: The role of teacher expectations, academic self-concept, and class context in students' math achievement', *Contemporary Educational Psychology* 59, 101787. https://doi.org/10.1016/j.cedpsych.2019.101787

Talkar, T., Williamson, J.R., Hannon, D.J., Rao, H.M., Yuditskaya, S., Claypool, K.T. et al., 2020, 'Assessment of speech and fine motor coordination in children with autism spectrum disorder', *IEEE Access* 8, 127535–127545. https://doi.org/10.1109/ACCESS.2020.3007348

Tárraga-Mínguez, R., Gomez-Marí, I. & Sanz-Cervera, P., 2020, 'Interventions for improving reading comprehension in children with ASD: A systematic review', *Behavioral Sciences* 11(3), 1–13. https://doi.org/10.3390/bs11010003

Tissot, C. & Evans, R., 2003, 'Visual teaching strategies for children with autism', *Early Child Development and Care* 173(4), 425–433. https://doi.org/10.1080/03004430320000079104

UNDESA, 2022, *The sustainable development goals report 2022*, pp. 34–36, United Nations, viewed 28 June 2025, from https://unstats.un.org/sdgs/report/2022/.

UNESCO, 2017, *UNESCO*, pp. 1–173, United Nations Educational, Scientific and Cultural Organization, viewed 20 May 2025, from https://unesdoc.unesco.org/ark:/48223/pf0000261971.

Vaismoradi, M., Jones, J., Turunen, H. & Snelgrove, S., 2016, 'Theme development in qualitative content analysis and thematic analysis', *Journal of Nursing Education and Practice* 6(5), 100. https://doi.org/10.5430/jnep.v6n5p100

Walker, S., Clendon, S., Paynter, J., Flückiger, B., Bowen, R., Sullivan, R. et al., 2023, 'Observing the classroom literacy environment of children on the autism spectrum in specialist classrooms', *Australian Journal of Education* 67(1), 28–45. https://doi.org/10.1177/00049441221107424

Whalon, K.J., Al Otaiba, S. & Delano, M.E., 2009, 'Evidence-based reading instruction for individuals with autism spectrum disorders', *Focus on Autism and Other Developmental Disabilities* 24(1), 3–16. https://doi.org/10.1177/1088357608328515

Whalon, K.J. & Hart, J.E., 2011, 'Children with autism spectrum disorder and literacy instruction: An exploratory study of elementary inclusive settings', *Remedial and Special Education* 32(3), 243–255. https://doi.org/10.1177/0741932510362174

Williams, P., 2006, 'Exploring the challenges of developing digital literacy in the context of special educational needs communities', *Innovation in Teaching and Learning in Information and Computer Sciences* 5(1), 1–16. https://doi.org/10.11120/ital.2006.05010006