

## Instructional strategies that foster reading skills of learners with intellectual disability: A scoping review

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### Suggested Citation:

Jacob, U. S. & Pillay, J (2022). Instructional strategies that foster reading skills of learners with intellectual disability: A scoping review. *Cypriot Journal of Educational Science*. 17(7), 2222-2234  
<https://doi.org/10.18844/cjes.v17i7.7589>

Received from March 25, 2022; revised from May 10, 2022; accepted from July 02, 2022.

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### Abstract

Effective learning and classroom interaction depend on learners' reading skills. In essence, reading is the cornerstone of academic success. Thus, functional literacy enhances learners' abilities irrespective of their intellectual abilities. Learners with intellectual disability will have an improved ability to understand and apply the information learnt to real-life situations. This scoping review aimed to examine instructional strategies adopted to foster the reading skills of learners with intellectual disabilities. A database search of relevant studies revealed 522 academic papers. Only six articles met the inclusion criteria for an in-depth analysis of studies on the use of instructional strategies to improve reading skills among learners with intellectual disabilities. The study included in this review used six strategies to improve reading skills. Furthermore, all strategies except phonics-based instruction effectively enhanced reading skills. Based on these findings, we recommend that workshops be organized for professionals providing services to learners with intellectual disabilities on the advantages of applying appropriate instructional strategies to develop reading skills among learners with intellectual disability. Moreover, larger sample sizes are required in future studies to draw generalizable conclusions.

**Key words:** fostering; learners; instructional strategies; intellectual disability; reading skills

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## 1 Introduction

The need to develop effective reading skills using appropriate instructional strategies has led to changes in reading instruction methods and emphasis on learners with intellectual disabilities (IDs) in recent years. It is important to note that the initial goal was to teach functional sight words to students with ID to improve their daily lives (Conners, 1992; Houston & Torgensen, 2004). Additionally, this method of instruction primarily involves drills and practice exercises intended only to address early word identification and other isolated reading skills (Browder, 2001). Consequently, students learned how to identify words but had difficulty reading the connected texts. It is critical to maintain a gap between research and practice in education, regardless of the cause.

Research should be the basis for enhancing and developing teaching and learning practices (Cochran-Smith, 2004). The need for effective educational interventions among students with intellectual disabilities is evident (Shapiro, 2011). Therefore, researchers have begun investigating how students with ID respond to evidence-based reading strategies that are successful for students struggling with reading abilities (e.g., learning disabilities). Learners with moderate to severe intellectual disabilities, whose IQ is equal to or less than 50–55, are unable to develop skills for decoding prints. Consequently, reading instruction for these students has been underemphasized and has focused mainly on sight words (Ahlgrim-Delzell & Rivera, 2015; Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzinexya, 2006).

Reading should not be seen as simply decoding letters, words, and subsequent sentences, resulting in a complete understanding of the content (Bojovic, 2010). Reading as the cornerstone of effective learning constitutes the foundation on which academic achievement is based (Adeolle, 2005); therefore, functional literacy will enhance reading resulting in understanding and application of information to solve life challenges (Ekpo, 2008). The ability to read and write is an essential skill required for effective social interactions. For persons with intellectual disabilities, literacy skills are crucial, especially for individuals with limitations in intellectual functioning and adaptive behaviours (American Psychiatric Association, 2013; Schalock et al., 2010), because of the need to communicate in the learning environment and socialization.

This means that enhanced literacy leads to improved social participation, quality of life, and self-esteem (Forts & Luckasson, 2011). There is substantial evidence that a significant number of people with ID are illiterate or have difficulty reading (Ratz & Lenhard, 2013). Reading is an essential skill for social, intellectual, and personal growth (Ihejirika, 2014) in addition to being strongly correlated with intelligence quotient levels (Bransford, Brown & Cocking, 2000). There is a critical need for more high-quality testing on a single subject and in groups with severe intellectual disabilities, as these types of experiments are essential for building evidence-based special education programs. To identify Evidence Based Practice for learners with severe ID, professional organizations and independent scholars have applied the standards developed by Gersten et al. (2005). By emphasizing instructional approaches that have proven effective through credible research (Slavin, 2008), it seeks to improve the quality of education as well as student outcomes.

Some practices improve learning outcomes more than others (Hattie, 2009), although ineffective instructional strategies tend to be used more frequently (Burns & Ysseldyke, 2009).

This is probably because of the difficulty faced in identifying instructional strategies that can be tested, which are suitable for learners with intellectual disabilities (IDs) and allow their active participation in the classroom. We do not know why instructional practices that produce small effects continue to be used. These ineffective methods may persist partly because teachers rely more on informal information than on research to select instructional methodologies (Landrum et al., 2002). Some limitations experienced by children with intellectual disabilities include not having a strong drive to read, having a short memory, expecting visual teaching, and learning (Munir, 2018). Considering that skill-based instructional programs continue to be the norm for students with significant intellectual disabilities (Katims, 2000; Erickson et al., 2009). Our goal was to show how certain themes and

practices in the literature can be used as an effective method for teaching reading to students with disabilities.

In this study the term intellectual disability (ID) refers to people who have a limited ability to comprehend new information, learn new skills (impaired intelligence) and have a restricted ability to cope independently (restricted social functioning). The term 'persons with learning disabilities (LD)' in the United Kingdom (UK) describes individuals who are referred to elsewhere as 'people with intellectual disabilities or 'people with developmental disabilities' (AAIDD, 2010). Previously known as mental retardation, intellectual disability occurs when the brain fails to develop adequately during or before birth (during the developmental period) (Jacob et al., 2022). Significant social and adaptive deficits are associated with this condition. Intellectual disability refers to significant limitations in cognitive functioning and adaptive behaviour patterns before the age of eighteen years (Schalock et al., 2010).

Individuals with intellectual disability exhibit significant limitations in their academic, social, emotional, behavioural, and adaptive skills due to a delay in brain development during the developmental period (Jacob et al., 2022; Oyundoyin, 2013). Katz and Lazcano-Ponce (2008) noted that abnormalities have the significant social impact on affected individuals. One remarkable fact is that ID differs from other cognitive disabilities, such as mental illness, brain injury, dementia, and autism (Intellectual Disability Rights Service, 2009). It is a disability characterised by abnormal aggressiveness or seriously irresponsible conduct on the part of the person concerned (Adeoye, 2019).

The purpose of this review is to gain a comprehensive understanding of the studies conducted on strategies for improving reading skills among individuals with intellectual disabilities. The research questions we formulated were as follows:

1. Whose perspectives were considered in the study (learners, students, and individuals with intellectual disability)?
2. Describe how the study's focus population differs from one another?
3. Based on the research studies, what conclusions were drawn?

## 2 Methods

We conducted a comprehensive search of relevant articles. The search terms used were reading, reading skills, intellectual disability, and intervention. This review included journal articles published between January 2015 and October 2021. We identified 522 studies through keyword searches in the EBSCO Host, Scopus, and Google Scholar databases.

### 2.1. Selection criteria

The Preferred Reporting Items for Systematic Literature Reviews and Meta-Analyses (PRISMA) was used as a screening tool (Ghafari et al., 2006). The search aimed to map the available literature on instructional strategies for enhancing the reading skills of individuals with intellectual disability. The review excluded all research articles published before 2016. The search was not limited to specific location. A total of 516 research articles were excluded (see Figure 1). The conclusion of a literature review is not affected by the inclusion or exclusion of dissertations (Vickers & Smith, 2000; Jacob et al., 2022).

### 2.2 Outcome of search

We found 522 articles on topics related to instructional strategies for fostering reading skills among individuals with ID in various databases (PubMed, Scopus, Google Scholar and Ebscohost) (Figure 1). Prior to conducting the search, the inclusion and exclusion criteria were established. Of the 522 articles, 490 were removed based on publication year, type of document, stage of publication, publication language and source type. Due to duplication and irrelevance to the current review, 37 articles were removed from the remaining 52 articles. Nine (9) articles were removed from the

remaining 15 titles based on access to the complete article, primary participants, preliminary study, and the scope of the study. In the data extraction, the selection stages and attributes were as follows:

Inclusion was restricted to articles that addressed reading problems among individuals with intellectual disabilities.

The article must be in English

The year of publication must be between 2015–2021

The only articles considered were empirical articles that presented mixed-method, quantitative, or qualitative research results; policy papers and review articles were not considered (Wise et al., 2010; Jacob et al., 2022).

### 2.3 Quality Assessment

The purpose of each article was summarized using qualitative content analysis. For the first research question, we coded the articles based on their present perspectives. Here, we explored the voices that were being heard in the study: learners, students, and individuals with intellectual disability. For the second research question, we describe the study focus and design. We summarized the main findings of the articles included in our third research question. Our initial findings serve as a starting point for the development of more general categories. To ensure reliability approximately 20% of the included studies were coded independently by the authors. Using a percentage agreement as a basis for inter-rater reliability, the authors found that 89.5% of all the codes agreed. Disagreement in study coding were discussed so as to reach a consensus between the authors.

### 2.4 Ethics

All the articles used in this review were freely available in the public domain; therefore, none of the ethical considerations was necessary for the study.

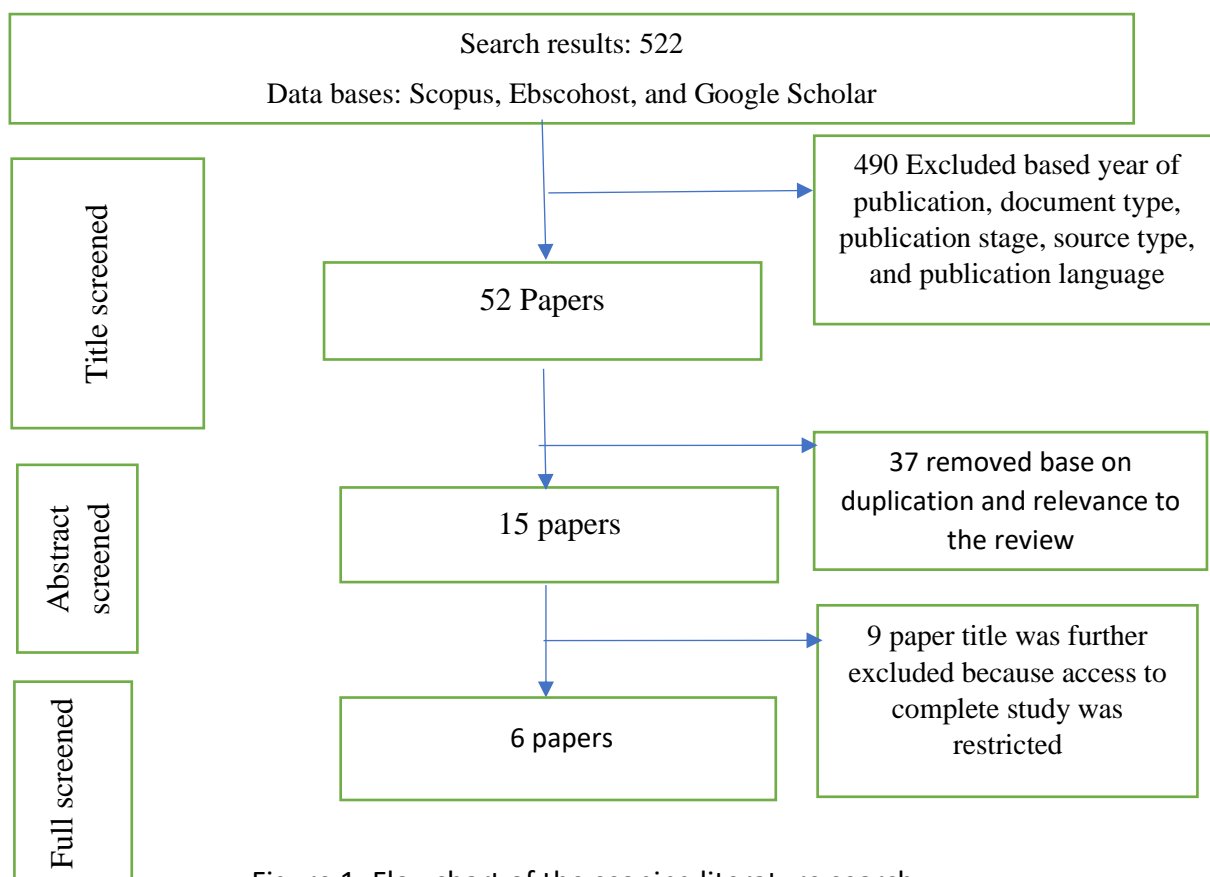


Figure 1: Flowchart of the scoping literature search

## 2.5 Data extraction

For this review, data were extracted from identified articles using a five-column form. This form contained detailed information on the author(s), the year of publication, the title of the paper, and the participants in the study. Researchers consulted two colleagues to validate the information gathered: one from the Department of Early Childhood Education and the other from the Department of Educational Psychology in universities in South Africa. All the identified studies were assessed and critiqued by the two colleagues.

**Table 1: Research on Reading Instruction for Students with Significant ID**

Authors	Year of publication	Title	Design	Population
Dessemontet et al.,	2021	“Effects of a phonics-based intervention on the reading skills of students with intellectual disability”	Random assignment, treatment, and control group design	48 non decoding elementary students with intellectual disability
Jacob & Pillay	2021	“Effectiveness of music therapy on reading skills of pupils with intellectual disability”	Pretest and Posttest design	17 pupils with intellectual disability
Munir <i>et al.</i>	2018	“The effectiveness of multimedia in education for special education (mese) to improve reading ability and memorizing for children with intellectual disability”	Single Subject Research	2 children with intellectual disability from Special Education School in Sukabum
Gomes <i>et al.</i>	2017	“Effects of echoic teaching combined with basic reading repertoires on word naming in children with intellectual disabilities”	Experimental study	2 children with Down syndrome and intellectual disabilities, with difficulties in vocalization
Jacob et al	2021	“Pictorial illustration for enhancing reading skills of learners with intellectual disability”	Quasi experimental design of pretest-posttest control group	17 learners with intellectual disability
Garrels	2018	“Student-directed learning of literacy skills for students with intellectual disability”	Single-case experimental design	5 adolescents with mild intellectual disability

### 3 Results

#### 3.1 Description of study participants

Overall, a total of 91 persons with intellectual disability participated in the study. Among all the retrospective studies, Dessemontet et al. (2021) had the highest number of participants of 48 diagnosed as nondecoding elementary students with intellectual disability. Jacob & Pillay (2021) and Jacob et al (2021) included 17 learners with intellectual disability in their study, while the study conducted by Garrels (2018) included 5 adolescents with intellectual disability. The study conducted by Munir *et al.* (2018) included 2 children with intellectual disability and that of Gomes *et al.* (2017) included 2 children with Down syndrome and intellectual disability.

**Table 1: Research Objective and Method of Data Analysis**

Authors	Year of publication	Objective	Method of data analysis
Dessemontet et al.,	2021	The effectiveness of a phonics-based intervention program in improving the reading progress of French-speaking elementary school students with intellectual disabilities was evaluated.	Analysis of Variance
Jacob & Pillay	2021	The study examined the effect of music therapy affects reading skills among pupils with intellectual disabilities.	Analysis of Covariance (ANCOVA)
Munir <i>et al.</i>	2018	This study aimed to determine whether Multimedia in Education for Special Education (MESE) helps students improve their reading skills and memory.	Mean Score and graphs
Gomes <i>et al.</i>	2017	In this study, echoic teaching combined with figure naming was employed to boost children with intellectual disabilities' acquisition of discriminative repertoires before reading.	Percentage and Categorization of the reading performance
Jacob et al	2021	This study used pictorial illustrations to enhance the reading skills of learners with intellectual disabilities.	Analysis of Covariance (ANCOVA)
Garrels	2018	Using student-directed learning as a method of addressing both motivation and performance challenges among students with intellectual disability was explored in the study	Not specified

#### 3.2 Study's focus population differs from one another

Fifty percent of the included studies were conducted in 2021, including Jacob and Pillay (2021), Jacob et al. (2021) and Dessemontet et al. (2021). A total of 33.3% of the included studies were conducted in 2018 by Garrels (2018) and Munir *et al.* (2018), while the study conducted by Gomes *et al.* (2017) made up 16.7% of the included studies. The study designs adopted in the included studies were



single-case experimental designs by Munir *et al.* (2018) and Garrels (2018) and pretest posttest control groups by Jacob and Pillay (2021) and Jacob *et al.* (2021), while random assignment, treatment and control group designs were used in Dessemontet *et al.* (2021). Gomes *et al.*'s (2017) intervention was conducted using an experimental study design.

### 3.2 Cumulative Finding

The results in Table 1 show that six different types of instructional strategies were adopted in fostering the reading skills of learners with intellectual disability, and the effect was significant. Phonics-based instruction was used as an intervention by Dessemontet *et al.* (2021) in a study that lasted 7 months. The researchers reported that significant progress was made by students in the treatment group in word and nonword, which was assessed using a researcher-designed test with a medium effect size. The treatment made a significant difference on spelling ( $p = .058$ ) and on word and nonword reading measured with a standardized test ( $p = .060$ ) with medium effect sizes. In a study conducted by Jacob and Pillay (2021), music therapy was used to enhance the reading skills of intellectual learners. The purposive sampling technique was used for the selection of seventeen (17) learners with intellectual disability.

There were two groups of participants in the study, one receiving music therapy, the other receiving a placebo treatment (control group). The experimental group received 18 sessions of music therapy. The participants' pretest and posttest scores differ significantly from one another. Nevertheless, there was no significant interaction between treatment and parents' socioeconomic status on participants' reading skills.

Gomes *et al.* (2017) examined the efficacy of echoic teaching in conjunction with basic reading repertoires among children with intellectual disability. Results revealed that vocal topography was modified after participants viewed a printed text, resulting in fewer errors and increasing conformity with verbal conventions. Through a comparison of pre- and posttests, the researchers were able to demonstrate that participants' responses to the emerging relationships, as well as the naming of printed words, changed. Consequently, learners who initially did not know any naming words were able to read the two words taught, which improved performance on relational tasks from 45% (mean, pretest) to 77% (mean, posttest).

Munir *et al.* (2018) reported that the use of multimedia applications during learning enhanced reading skills and the ability to memorize among study participants. The findings also revealed a decline in performance when the worksheet on reading ability and memorising of participants was assessed over several sessions. Jacob *et al.* (2021) explored the use pictorial illustration as an instructional strategy to enhance reading skills among learning with intellectual disability. During the study, learners with intellectual disabilities were exposed to pictorial illustrations for eight (8) weeks. Results showed significant improvements in their reading abilities. Participants exposed to pictorial illustrations had higher mean scores than those in the control group. Additionally, the interaction between treatment and verbal ability did not significantly affect participants' reading skills.

Using student-directed learning as a teaching strategy, Garrels (2018) examined the benefit of student-directed learning for developing reading skills among learners with intellectual disabilities. Based on the study's findings, participants' ability to set and attain academic goals relevant to reading and writing improved significantly. The students set literacy goals that targeted phonics, vocabulary development, fluency and comprehension, among other literacy components.

#### 4 Discussion of findings

We examined and compiled global research evidence regarding instructional strategies that foster reading skills among learners with intellectual disabilities. According to the authors, appropriate instructional strategies could contribute to improving the reading skills of learners with intellectual disabilities. Only six articles (Dessemontet *et al.*, 2021; Jacob & Pillay, 2021; Munir *et al.*, 2018; Gomes *et al.*, 2017; Jacob *et al.*, 2021; Garrels, 2018) were found by the authors that involved interventions

of some kind targeted at enhancing the reading skills of learners with intellectual disability (PubMed, Scopus, Ebscohost, and Google Scholar).

Findings from the reviewed studies established that reading skills of pupils with intellectual disability can be fostered using phonics-based instruction, music therapy, multimedia application, pictorial illustration, and student-directed learning. To teach language to young learners, reading and writing skills must be developed in individuals with intellectual disabilities (Carstens 2013). According to Lessing and De Witt (2002), reading is a single skill or proficiency of literacy that can be viewed as an aspect of meaning construction in which the learner must have a high level of decoding proficiency. Several developmental processes can lead to the development of the ability to read in children. They are letter and word recognition, decoding, comprehension, and how fluently the learner interacts with the text (Long & Zimmerman, 2009).

In addition, enhancing the word recognition skills of learners with intellectual disability is significant because word recognition is the greatest reading difficulty experienced by this group of learners (Mosito, Warnick, & Esambe, 2017). Having good word recognition skills will greatly enhance the ability of readers to recognize words effortlessly and generate a mental representation of the text's message (Allor et al., 2010b). Thus, learners who are struggling with word recognition will be deprived of the tools necessary to comprehend and store messages for later recall. However, the use of phonics-based instruction by Dessemontet et al. (2021) resulted in students who benefited from the intervention, making significant progress in word and nonword reading. This aligns with previous studies that have shown that students, irrespective of the level of mild, moderate, or severe intellectual disability, will be able to decode effectively when provided with explicit instruction in phonological awareness and phonics (Sermier Dessemontet, Martinet et al., 2019).

In a study conducted by Jacob and Pillay (2021), music therapy was found to be an effective treatment for developing reading skills of learners with intellectual disability. This is likely due to music being viewed as a multimodal approach that will likely appeal to learners' sense of hearing and seeing (demonstration) and kinesthetics. Since music therapy has been observed to have a significant effect on helping dyslexic learners develop reading skills (Linden & Ostermann, 2010; Overy, Patel, 2012), it can be used as an alternative method for developing reading skills of children with reading difficulties. One reason for this is because music therapy and reading share similar characteristics, such as reading phrases, writing, or reading from left to right, rhythmic eye movements, vocabulary building, understanding articulation, and paying attention to details (Diamantes, Young, & McBee, 2002).

Angvari et al. (2002) contended that music is a useful instrument for developing auditory perception, which can then be used to influence early reading development. The researchers found that children with higher music perception had higher reading skills at a beginning level. Other studies showed that the reading skills of learners with intellectual disability were enhanced using multimedia (Munir et al., 2018) and pictorial illustration (Jacob et al., 2021). The reason for the effectiveness may be based on the assertion of Fennell and Rowan (2001) that pictorial illustration is good in assisting learners to organize their thought and at the same time associate images seen with words. The picture will reduce abstraction by creating a fiction in the mind of the reader to help them understand the text's content. The ability to create mental images of a story in the learner's "mind eye" can enhance the quality of mental models, which can lead to better reading comprehension (DeKoning and Van der Schoot, 2013; Algozzine and Douville, 2004).

Several studies have examined the effect of multimedia on the reading of expository texts (Mayer, 2002; Carney and Levin, 2002). Among the findings of such studies, images can not only help create a mental representation but also help clarify implicit or unclear relationships in the text (Eitel and Scheiter, 2015). The addition of images to a text has also been shown to enhance student learning (Schnotz, 2002; Schnotz and Bannert, 2003; Schüler et al., 2015). Generalizations are difficult in a population as diverse as those of learners with intellectual disabilities (Kauffman & Hung, 2009). The method that works best for each learner with intellectual disability is difficult to determine. It might



be beneficial for students with mild disabilities to use approaches such as (Dessemontet et al., 2021; Jacob and Pillay, 2021; Munir *et al.*, 2018; Gomes *et al.*, 2017; Jacob et al 2021; Garrels, 2018). For students with moderate or severe intellectual disability, these approaches might not be appropriate. Moreover, regarding students with intellectual disabilities in general and for those with moderate to severe intellectual disabilities, some advanced skills such as fluency should be avoided.

## 5 Conclusion

Researchers have investigated instructional strategies that can enhance the reading skills of students with intellectual disabilities. The author reviewed six instruction strategies, including phonics-based instruction, music therapy, multimedia applications, and pictorial illustration. Participants' reading skills were significantly impacted by all instructional strategies except phonics-based instruction. Furthermore, the findings emphasize the importance of active involvement in research and examination of the intricacies of instructional strategies designed to promote reading skills of students with intellectual disabilities. Additionally, learning strategies that are appropriate for learners with intellectual disabilities need to be explained to caregivers, parents, and teachers of these learners. To establish a generalizable conclusion, future research should include a larger sample size.

The number of courses and training provided in special education preparation programs on teaching reading to students with intellectual disabilities may also be worth examining. It would also be beneficial to study teachers' perspectives regarding best practices in teaching reading to students with intellectual disabilities. Different reading strategies or interventions could also be explored across different levels of intellectual disability in future research. The results of such an investigation will offer a different perspective on how to assess the feasibility and practicality of certain methods. A positive result may occur when some methods are used in some experiments because teachers in the everyday context do not always have access to extra support.

**Funding:** This work was supported by the South African Research Chairs Initiative of the Department of Science and Innovation and National Research Foundation of South Africa. South African Research Chair: Education and Care in Childhood: Faculty of Education: University of Johannesburg South Africa [grant number: 87300, 2017].

**Conflict of interest:** The authors of this review declare that they do not have conflicts of interest.

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