

Evidence-Based Practices for Students with Visual Impairments in Regular Settings: An Integrated Review

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ABSTRACT:

Educating students with disabilities in regular education settings requires implementing confirmed strategies that foster effective inclusion within the school community. This integrated review explores evidence-based strategies that promote the academic and social inclusion of students with visual impairments in regular education schools. By outlining these strategies and providing practical insights, the review aims to equip educators, policymakers, and stakeholders with valuable guidance for creating inclusive learning environments that embrace diversity and accessibility. Drawing on the World Health Organization's balanced approach to integrating tacit and scientific evidence, the review synthesizes expert insights and empirical studies to highlight key factors and multifaceted approaches supporting the successful inclusion of students with visual impairments. The findings emphasize the importance of implementing the Expanded Core Curriculum, adapting the learning environment to meet students' needs, employing multisensory instructional methods, integrating assistive technology, and fostering collaborative support systems.

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INTRODUCTION

More and more today, there are growing voices stressing the need for educators and educational authorities to ensure the implementation of strategies that have solid evidence of effectiveness to support the inclusion of students with special learning needs (Hatton, 2014; Hornby, 2014; Ainscow, 2020; Mitchell & Sutherland, 2020). The term “evidence-based practice” is broadly used in the literature to describe key strategies and intervention programs that substantial empirical research has shown to significantly improve student outcomes (Cook & Odom, 2013). In response to low research findings, the term has evolved to integrate practical guidelines and perspectives from relevant experts and organizations (Bruce et al., 2016; Schlosser & Sigafos, 2008). This approach is consistent with the World Health Organization’s (WHO) perspective, which advocates for the use of both “scientific” and “tacit evidence” to inform policy and practice (WHO, 2021). WHO defines scientific evidence as information derived from formal, rigorous research processes, including primary studies (primary research), synthesis of existing evidence (secondary research), and evidence products such as evidence briefs for policy (tertiary research). Tacit evidence, on the other hand, refers to knowledge, information, or insights that are based on personal experience and valuable expertise (WHO, 2021).

Context

In recent years, the number of students with disabilities in regular education schools has continued to rise globally (Miyachi, 2020). Despite this increase in enrollment, research has shown that educational practices for these students have often failed to address their learning needs effectively (UNESCO, 2009). This issue raises significant concerns in visual impairment (VI), as educators and other stakeholders have frequently relied on techniques, procedures, curricula, and service delivery options based on little or no evidence (Ferrell, 2006). Numerous studies have highlighted a gap between the learning requirements of students with visual impairments (SVI) and the services provided, affecting their academic achievement in regular education schools (Blackstone et al., 2021; Diasse & Kawai, 2024; Miyachi, 2020; Mwakyeja, 2013; UNESCO, 2020; Yihun & Belay, 2020). This disparity between practice and learning needs derives from multiple factors, including educators’ lack of understanding of VI and its implications on learning (Koehler & Picard, 2024; Miyachi, 2020), teachers’ lack of preparation in

the inclusion of SVI (Kasebusha & Banda, 2021; Tseeke, 2021), inadequate or ineffective professional development services (Houchins et al., 2012; Morelle & Tabane, 2019; Negash & Gasa, 2022), a shortage of classroom materials in accessible formats (Ceralli, 2019; Habulezi & Phasha, 2012; Le Fanu et al., 2022), and a solo management of classroom responsibilities (Lakkala et al., 2016).

VI is ranked among the high-needs sensory impairments (Miyachi, 2020) but has a low prevalence among youths and school-going children (Bruce et al., 2016). In 2004, the Individuals with Disabilities Education Act (IDEA) in the United States declared it as a “low-incidence disability,” affecting less than 1% of the entire statewide student population (IDEA, 2004). Such a low occurrence of the disability reduces the chance of schools receiving SVI, leading to teachers’ lack of experience when they have them, misunderstandings, lower expectations, and a lack of knowledge about evidence-based practices (Bruce et al., 2016; Davis, 2003). Moreover, while pre-service training programs remain scarce, particularly in low-income countries, in-service teachers with SVI face significant challenges in accessing professional development opportunities (Diasse & Kawai, 2024; Maguvhe, 2015; Negash & Gasa, 2022; Tseeke, 2021; UNESCO, 2020). Furthermore, in some cases where professional development opportunities are available, the workshops tend to focus less on practical applications and more on theories emphasizing the importance of inclusive education (Morelle & Tabane, 2019). As a result, teachers struggle to adjust their teachings, often implementing a one-size-fits-all approach, which does not benefit SVI (Diasse & Kawai, 2024; Yihun & Belay, 2020).

This single teaching method correlates with the scarcity of classroom adaptations, which significantly affects the teaching and learning process (Habulezi & Phasha, 2012; Mwakyeja, 2013). Whereas teachers’ knowledge about effective practice is highly dependent on training and teaching experience (Mariga et al., 2014; Miyachi, 2020), effective implementation demands adequate resources (Walther-Thomas et al., 2000). Le Fanu et al. (2022) reviewed several case studies in sub-Saharan Africa. They concluded that both teachers and SVI are not often equipped with the required assistive materials, helping to address students’ diverse learning needs.

Another significant issue concerns the supply and availability of special needs teachers and paraeducators. As noted by Ainscow (2020) and Torres et al. (2012), effective implementation of evidence-based practices requires regular education teachers to receive support and

guidance from special needs teachers. In many low-income countries, such as those in Sub-Saharan Africa, research has highlighted a shortage of special needs teachers and a lack of support or collaboration with general education teachers (Diasse & Kawai, 2024; Negash & Gasa, 2022; UNESCO, 2020; Yihun & Belay, 2020). Lakkala et al. (2016) observed that when general education teachers are solely responsible for planning and implementing regular classroom courses, the chances of applying effective instructions are compromised. Additionally, this restricts their opportunity for professional growth and the improvement of their teaching practices (Venianaki & Zervakis, 2015).

UNDERSTANDING VISUAL IMPAIRMENT AND ITS IMPLICATIONS ON LEARNING

Visual impairment

VI refers to the functional limitations of the eyesight, which cannot be remedied by refractive correction – spectacles or contact lenses – surgery or medical methods (DeCarlo et al., 2006). It is characterized by irreversible vision loss or restricted visual field, leading to decreased contrast sensitivity, increased sensitivity to glare, and decreased ability to perform activities of daily living, such as reading and writing (Kavitha et al., 2015). The term includes both partial sight and blindness (Bajaj, 2019), encompassing various functional implications such as poor acuity, central vision loss, peripheral vision loss, color loss, and absence of vision (Salisbury, 2008). However, within educational settings, “blindness” and “low vision” are commonly used to categorize SVI (Davis, 2003; Kızılaslan, 2020). “Blindness” is used to describe students who have a total inability to perceive visual stimuli and rely on Braille for classroom reading activities (Mastropieri & Scruggs, 2010), while “low vision” refers to students who have residual sight but insufficient to use regular print materials effectively (Mwakyeja, 2013). Another aspect of VI is that it can be congenital (present at or shortly after birth) or acquired later in life due to external factors such as injuries, diseases, or environmental influences (Bajaj, 2019; Kasebusha & Banda, 2021). Whether it is blindness or low vision, congenital or acquired, VI has significant implications for students’ learning.

The impacts of visual impairments on learning

SVI cope with varied forms of difficulties to perform effectively at school in the same way as sighted students. The functional limitations of the visual sense negatively impact the teaching and learning process and students’

social interactions and emotional well-being (Kızılaslan, 2020). In educational settings, visual stimuli and information play a crucial role as primary factors in acquiring knowledge and developing cognitive skills (Kızılaslan, 2020). Children learn through observation to interpret what is happening in their surrounding environment (Fraser & Maguvhe, 2008; Kasebusha & Banda, 2021). It is estimated that 80% of the information the child gathers through learning is visual, and two-thirds of the brain is involved in processing visual information (MacCuspie, 1996). Scientific research has also demonstrated that visual tracking in infancy is a basic predictor of the child’s cognition, attention, and capacity for anticipation (Kaul et al., 2021). Children with blindness or low vision experience a restricted flow of sensory input, which can result in development retardation, deficiencies, or delays in acquiring fundamental skills generally learned through observation and imitation (Haakma et al., 2018; Kızılaslan, 2020). The implications are significantly complex in the case of congenital VI. The inability of the child to visually explore their immediate environment from birth affects their cognitive and language development (Bajaj, 2019; Mwakyeja, 2013), impacting their reasoning skills, problem-solving abilities, and abstract thinking (Mwakyeja, 2013). In their study, Kasebusha and Banda (2021) discussed these challenges, highlighting the difficulty that SVI face in giving meanings to objects, concepts, and ideas. They underlined a lack of visual memory, which is also a key component in the process of learning. Visual memory is an essential element of the cognitive system, which helps us remember characteristics of our senses related to our visual experiences (Berryhill & Olson, 2008). People without VI can store visual information of objects, animals, and humans in memory in a mental image that they can reactivate or use in a later experience. This capacity involves understanding the dynamic of “object continuity” or “object sustainment,” that is, the ability to comprehend that the objects still exist even if they are no longer visible (Kızılaslan, 2020). In the course of learning, the activation of our visual memory, also referred to as “the mind’s eye” (Berryhill & Olson, 2008), allows to retrieve and use previously observed illustrations to understand new concepts and experiences (Kasebusha & Banda, 2021). SVI depend chiefly on their remaining senses, particularly auditory and tactile, to access and process learning information. However, despite their crucial role in knowledge acquisition, the auditory and tactile senses do not always provide clear cues for conceptual development and understanding (Spungin, 2002).

Other consequences extend to classroom activities such as reading and writing. Instructional adjustment involves the implementation of Braille as the primary tool for students with blindness, replacing visual reading and traditional print materials. Braille is a tactile writing and reading system based on six raised dots arranged in cells (Salisbury, 2008). In each cell, the dots are combined in different patterns to represent letters, numbers, and written symbols (Figure 1). While crucial for the education of SVI, reading and writing involve significant challenges, including difficulties in maintaining speed, fatigue, precision, and understanding (Douglas et al., 2011; Mastropieri & Scruggs, 2010; Salisbury, 2008). As a tactile system, Braille is a slow medium by which a skilled reader can cover only a small fraction of the material that can be read by a seeing reader in the same amount of time (Agesa, 2014). The average reading speed is estimated at 125 words per minute (Kızılaslan, 2020). Kapur (2018) attributes this slowness to the fact that when using tactile reading through Braille, SVI process words at a letter

level rather than as complete words. This makes them pause frequently while reading and go slower than their sighted peers. Studies interested in literacy have observed similar challenges among students with low vision. While they use large print fonts to perform reading and writing, students with low vision also experience delays in speed, spelling errors, and reduced comprehension (Douglas et al., 2002; Hill et al., 2002).

As a result of difficulties in feeling connected to their environment, research has also observed a lack of motivation among SVI (Haakma et al., 2018). The absence or poor sight impacts students' orientation and mobility skills, often causing frustrations, lack of confidence, fear, and disengagement with their social surroundings (Kızılaslan, 2020). According to Wolffe (2000), children with VI who experience overprotection from their families are more likely to avoid interacting with others once they are in school. Agesa (2014) notes that, when placed in a new environment, the blind child may lose their cues and be affected to the extent of having to start

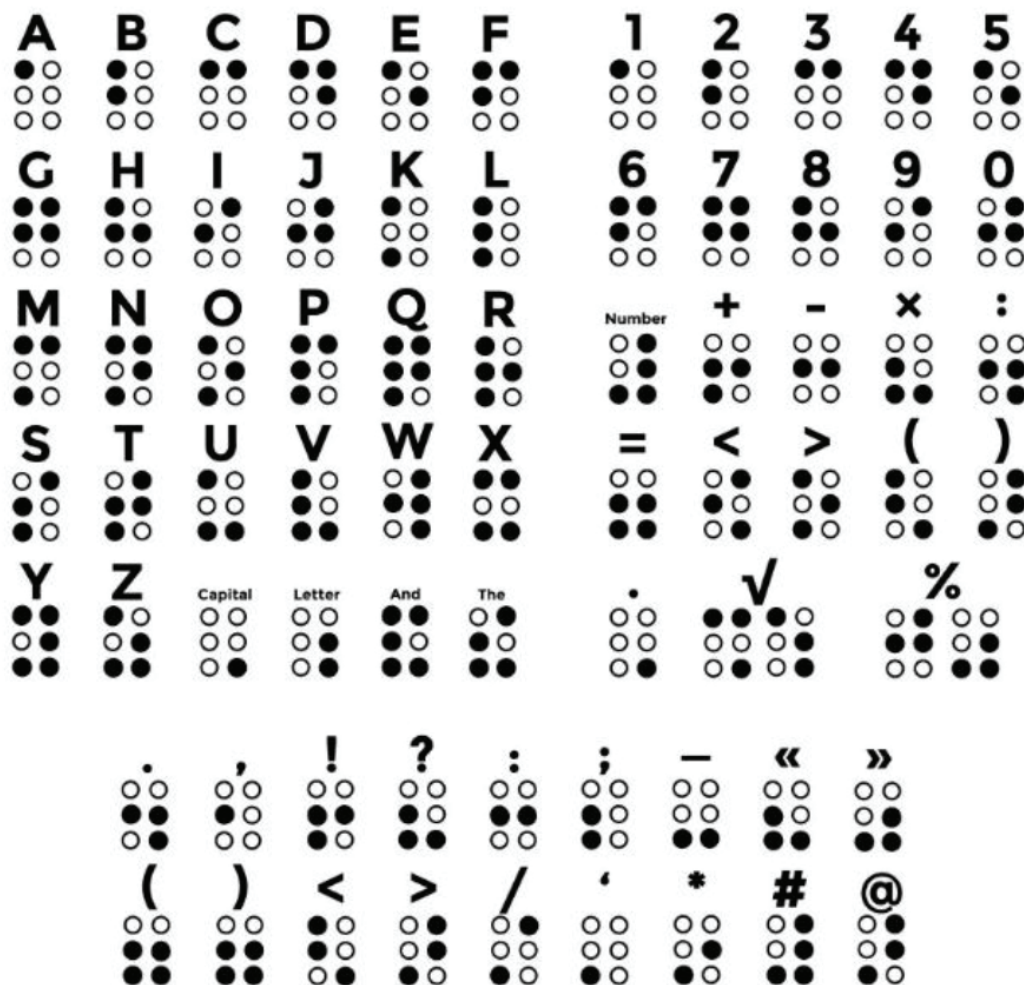


Figure 1. Braille alphabet, numbers, and symbols

anew. These children may develop other fears, such as the feeling of being watched, unloved, unwanted, falling, bumping, and inability to do or participate in anything (Kızılaslan, 2020). In other cases, it brings about a feeling of revolt and resentment against their sighted peers who manage to move about and pursue their activities independently of others (Agesa, 2014).

Overcoming these challenges within regular education settings requires effective intervention programs and instructional practices based on evidence. There is a growing interest in evidence for policy and practice in inclusive education. However, a pressing need remains to encourage studies documenting evidence-based practices and their effectiveness (Kelly & Smith, 2011; Mitchell & Sutherland, 2020). Research in the field often overlooks the uniqueness of low-incidence disabilities such as VI, tending to employ a more generalized approach (Davis, 2003). To support the inclusion of SVI within regular education settings, it is crucial to recognize their unique learning needs and develop practical guidelines for educators who may lack knowledge about effective practices. Therefore, this review aims to illuminate evidence-based strategies that can be utilized to enhance the inclusion of SVI in regular education schools, providing valuable guidance for educators, administrators, and policymakers.

METHOD

This review study derives from a comprehensive literature search conducted for the purpose of a doctoral thesis, approved by the Research Ethics Review Board of Hiroshima University under reference number HR-ES-000731,

dated 10 January 2023. More limited in scope compared to the thesis, which examined various strategies for the inclusion of SVI, this review exclusively aims to synthesize evidence-based practices commonly discussed in the existing literature. It employs an integrative approach, drawing from diverse sources of information to achieve the research objective. Studies suggest using an integrative approach when the topic is not extensively researched (Lang et al., 2007; Mdoe et al., 2024; Schlosser & Sigafoos, 2008; WHO, 2021). Given the limited amount of research available, the review integrates both empirical studies and experts' insights from different books and chapters, encompassing both "scientific" and "tacit evidence." Our review method followed a five-step process, as described in Figure 2. The selected studies and works were identified through several databases, including Google Scholar, ERIC, ResearchGate, Academia, Elsevier, Routledge (Taylor & Francis), SAGE, ScienceDirect, and Semantic Scholar. The search process through these databases was guided by the following keywords: 'visual impairments,' 'blindness,' 'low vision,' 'students with visual impairments,' 'inclusive placement and accessibility,' 'evidence-based practices,' 'support services' (including academic, social, and environmental support), 'teaching strategies,' and 'classroom interventions.'

FINDINGS

The review study aligns with WHO's integrative approach to using tacit and scientific evidence. According to WHO (2021), the relationship between the two is not conflicting but complementary. Given the research gap in the effectiveness of inclusive education practices con-

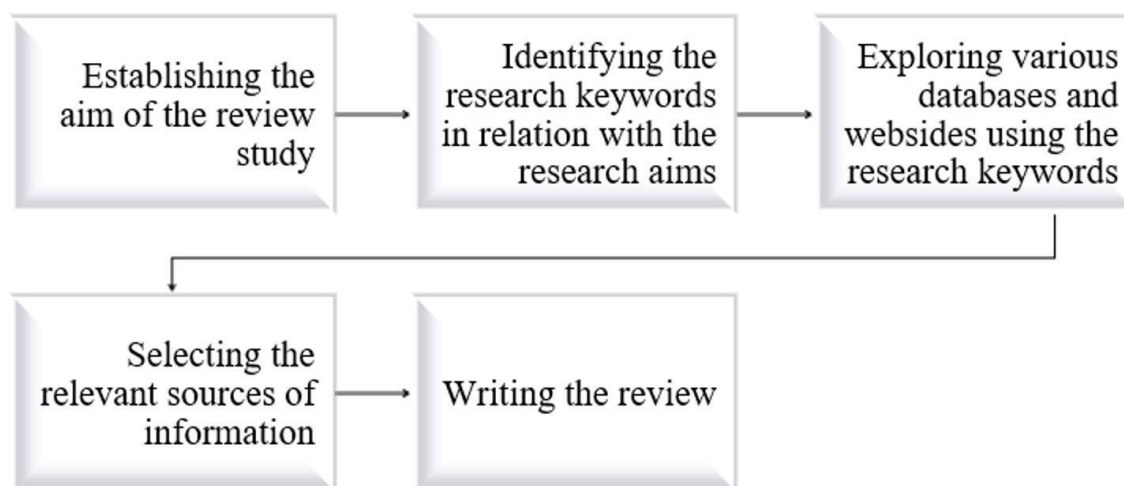


Figure 2. The review research process

cerning SVI, this review incorporates findings from available studies and practice guidelines from experts. Based on the selected sources, the author has identified several strategies that are recognized as effective in supporting the inclusion of SVI in regular education settings. These strategies are grouped into five categories under the following themes: (1) the Expanded Core Curriculum, (2) classroom placement, (3) multisensory instruction and assistive technology, (4) teacher collaboration, and (5) collaborative learning.

The Expanded Core Curriculum

Educators of SVI have long sought and provided instructional services in areas that help compensate for vision-related skills, facilitating their inclusion in both school and society (Ferrell et al., 2014). These instructional services are referenced in the literature under different names, such as life skills (Salisbury, 2008), additional curriculum (David, 2003), disability-specific curriculum (Miyachi, 2020), or, more commonly, the Expanded Core Curriculum (ECC) (Bajaj, 2019). The ECC is widely accepted as a fundamental body of instruction designed to equip SVI with the skills, knowledge, and behavior necessary to

enhance their access to the core curriculum, promote social interaction and inclusion among peers, and more fully in the community (David, 2003; Sapp & Hatlen, 2010). Content areas of the ECC include nine skills: (1) compensatory access skills, (2) sensory efficiency, (3) assistive technology, (4) orientation and mobility, (5) social interaction, (6) self-determination, (7) independent living, (8) recreation and leisure, and (9) career education, (Figure 3).

Despite its widespread implementation as a crucial component in the inclusion of SVI, empirical research needs to provide substantial evidence regarding its social and academic outcomes for SVI (Johnson-Jones, 2017). However, existing research has provided evidence of significant outcomes from implementing the ECC. For instance, Wolfe and Kelly (2011) studied the relationship between ECC instruction and SVI transition outcomes. They concluded that students who received high-quality instruction in the ECC experienced a richer quality of life in school and society. A large part of the literature is made of non-research evidence supporting the implementation of the ECC as a valuable tool to boost students’ academic and social skills. Exploiting expert documents informs the endorsement of the ECC as an

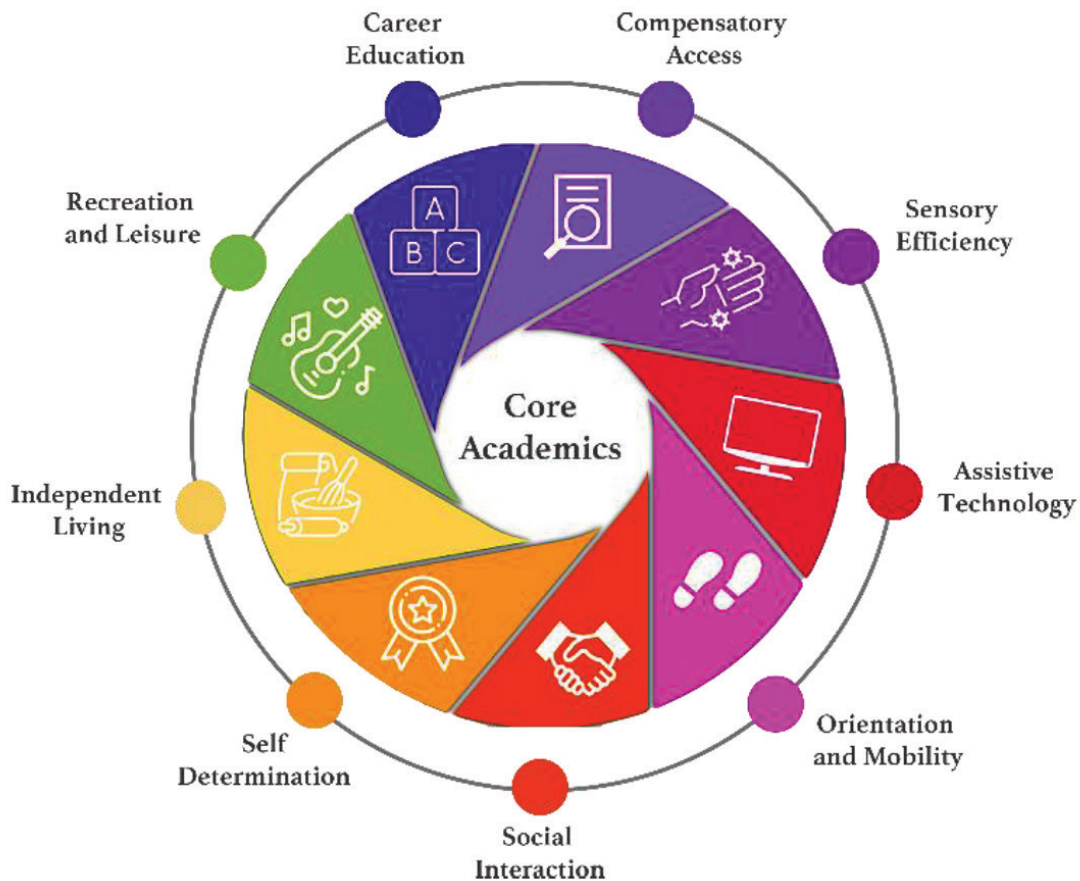


Figure 3. Components of the Expanded Core Curriculum

effective approach for providing SVI with a greater sense of agency, self-confidence, and motivation (Bajaj, 2019; Davis, 2003; Salisbury, 2008). On the other hand, research has shown that due to some challenges attributed to workload and a lack of expertise, some key areas of the ECC are not often covered (Sapp & Hatlen, 2010; Wolffe & Kelly, 2011). Wolffe et al. (2002) found that teachers tend to prioritize academic and compensatory skills due to time constraints, allocating limited time to other areas of the ECC.

Classroom placement

The International Classification of Functioning, Disability, and Health has offered a new approach to disability management, which sees the environment as an extra factor impacting social life activities (WHO, 2001). To facilitate their education in a general setting, article 24 of the UN Convention on the Rights of Persons with Disabilities recommends the provision of a reasonable accommodation to meet the learning requirements of students with disabilities (United Nations, 2006). In the area of VI, empirical studies have overlooked the effectiveness of the employed strategies, focusing mainly on environmental barriers affecting access and accessibility (Mwakyjeja, 2013; Negash & Gasa, 2022). Classroom accommodations for SVI students are largely guided by “tacit” or “best available” evidence obtained through experts’ recommendations. Our review study involves several recommendations provided by Colclasure et al. (2016), Cox and Dykes (2001), Davis (2003) and Salisbury (2008). To promote participation, experts support that classroom should be arranged without physical obstacles, and SVI should be seated in the most suitable position in the front rows to ensure proximity to the teacher and board to provide optimal focus (Colclasure et al., 2016; Davis, 2003; Salisbury, 2008). Given that SVI are sensitive to direct light and glare, which often can cause distraction, lighting should be adjusted according to the students’ needs (Cox & Dykes, 2001; Salisbury, 2008). Davis (2003) and Salisbury (2008) observe that a good practice is to remove or cover reflective areas such as classroom windows to reduce glare. Additionally, placing students in a single fixed classroom and avoiding rotation is recommended, as changing the physical environment is disorienting (Davis, 2003).

Multisensory instruction and assistive technology

Teachers of SVI are encouraged to enhance curriculum accessibility through non-visual means, using the hearing and touch senses (Davis, 2003). Multisensory instruction

and the use of assistive aids are discussed in the literature as effective strategies for including SVI (Bajaj, 2019; Dettmer et al., 2009; Douglas et al., 2011; Kelly & Smith, 2011). Both research and expert documentation support the use of multisensory teaching techniques, which encompass oral communication, tactile stimulation, and audio-based learning. Experts emphasize that using manipulative patterns such as illustrative models, tactile diagrams, and relief images is vital for SVI to understand concepts and process oral information (Bajaj, 2019; David, 2003; Lieberman et al., 2018; Salisbury, 2008). Recent studies in STEM-related subjects have proved that the “hands-on instruction” method, connecting instruction to tactile experience, motivates SVI and improves participation (Koehler & Picard, 2024). Klingenberg et al. (2019), Mustafa et al. (2022), and Teke and Sozbulir (2019) studied the use of tactile imagery and 3D models in geometry, mathematics, and science classes, including SVI. They concluded that tactile experience through effective assistive devices enhances SVI’s performance.

Audio-based learning has received similar recognition in the literature (Mwakyjeja, 2013). Dettmer et al. (2009) suggest combining Braille reading with listening to recorded versions effectively enhances students’ literacy skills and boosts motivation. According to Salisbury (2008), in comparison with Braille medium, audio-recorded materials are easier to process for information and more advantageous for background reading at home. Research in the field has focused on the latest audio devices, such as text-to-speech software and robotic sound. In their review, Nees and Berry (2013) found that despite some challenges related to training and support, audio-assistive technology is still a valuable tool to increase and diversify access.

Teacher collaboration

Teacher collaboration is among the best effective inclusive education practices (Friend & Cook, 2017; Hornby, 2014; Mitchell & Sutherland, 2020). Regular and special needs teachers are required to combine their expertise and work together in planning, implementing, and assessing teaching outcomes (Bajaj, 2019; Rytivaara & Kershner, 2012). Through teacher collaboration, the regular teacher will feel more equipped and prepared to address the needs of all students (Bajaj, 2019; Venianaki & Zervakis, 2015). Davis (2003) wrote her book, *Including Children with Visual Impairment in Mainstream Schools: A Practical Guide*, based on multiple case studies she conducted on teaching practices. She asserts: “Some best practice we observed during our research was when the teaching assistant, visiting teacher, and class teacher worked to-

gether in a team, sharing knowledge and skills, and diversifying in their roles.” Davis (2003) observes that this allowed the regular teacher to gain skills in Braille, which they usefully employed to support the students. Research recognizes collaborative teaching as an effective inclusive practice but often focuses on the barriers preventing its implementation (Friend & Cook, 2017; Hornby, 2014; Lakkala et al., 2016). In different studies, teachers of SVI express their wish for collaboration. Still, they are not given the opportunity because of a lack of clear inclusive education policies, a lack of special needs teachers, poor training, and workload (Diasse & Kawai, 2024; Morelle & Tabane, 2019; Negash & Gasa, 2022; Ralejoe, 2021; UNESCO, 2020; Yihun & Belay, 2020).

Cooperative learning

Cooperative learning is a popular and effective inclusive strategy that significantly enhances students’ academic and social living skills (Hornby, 2014; Mastropieri & Scruggs, 2010). It involves teachers creating a classroom environment where students with diverse learning needs develop the confidence and skills to work and learn together in small groups, supporting each other (Michell & Sutherland, 2020). Pair work and peer-tutoring are widely used strategies wherein a student tutor guides another student (the tutee) in learning activities (Bajaj, 2019; Michell & Sutherland, 2020). Davis’ (2003) findings confirmed the effectiveness of this strategy as SVI took active roles in group activities. She observed that “there was much discussion among the students about the writing activity, and students with blindness were actively involved using their electronic Braille.” (Davis, 2003). In his study, Mwakyjeja (2013) observed that sustained efforts and encouragement of peer support over the long term significantly contributed to the development of positive social relationships between SVI and their peers without impairments. This approach also played a crucial role in teachers’ efforts to narrow the gap in learning outcomes between these groups.

DISCUSSION

This review employed an integrative approach to examine evidence-based practices used to include SVI in regular education schools. The exploration of expert documentation and research findings highlighted five strategies that positively impact student outcomes: (1) implementation of the ECC, (2) flexible classroom placement, (3) multi-sensory learning through assistive technology, (4) collaborative teaching, and (5) cooperative learning.

The synthesis of tacit and scientific evidence revealed a notable gap in empirical research concerning the effectiveness of educational strategies for SVI in regular settings. Compared to research findings, expert documentation has provided deeper insights into practices that effectively influence student learning. The results align with previous findings, which also identified considerable knowledge-based evidence and a need for a more rigorous base of scientific evidence. For instance, studies by Ferrell et al. (2014), Johnson-Jones (2017), and Kelly and Smith (2011) underscore the limited empirical basis for strategies such as the ECC, classroom placement, and assistive technology. Echoing these findings, the review highlights a clear need for further research evidence in the abovementioned areas.

The integration of tacit evidence in this review underscores the importance of expert perspectives and documentation in contemporary education. Hornby (2014) notes that having a strong research evidence base is just one of several considerations when selecting instructional strategies. Educational interventions also need to be implemented within the current realities of schools, which are highly dependent on professional wisdom built on experience (Cook & Cook, 2013). Among the five inclusive strategies highlighted in this review, the best available evidence comes from experts who provide practical guidelines applicable in regular education settings. Empirical studies, when available, have frequently validated these expert recommendations regarding effective strategies found in non-research documents. Furthermore, in areas where research is limited, expert knowledge continues to guide practice, often resulting in significant outcomes.

The review also highlights various barriers affecting the implementation of evidence-based strategies. In relation to the ECC, the review corroborates findings from Douglas et al. (2011), which highlighted that inclusive strategies in some education services involve only a partial implementation of the ECC. Due to heavy workload and a shortage of special education teachers, some critical areas of the ECC, such as self-determination skills and career education, were eluded (Sapp & Hatlen, 2010). While teacher collaboration has been identified as an effective strategy, it is often hindered by this shortage of special needs teachers. Although general education teachers should possess a generic set of pedagogical strategies, it is crucial to acknowledge the role of special education teachers and promote a collaborative approach (Miyauchi, 2020). This lack of support and collaboration is similarly observed in the implementation of assistive

technology and multisensory instruction, as regular education teachers have yet to receive adequate training in these areas.

CONCLUSION

This integrative review underscores the necessity of implementing evidence-based practices for including SVI in regular education settings. The five highlighted strategies –implementation of the ECC, flexible classroom placements, multisensory learning through assistive technology, collaborative teaching, and cooperative learning – emphasize the critical role of expert knowledge and empirical evidence in shaping effective inclusive educational practices for SVI. However, significant gaps remain in empirical research regarding the effectiveness of these strategies.

One limitation of this review is its reliance on expert documentation, which, while insightful, may lack rigorous scientific validation. Furthermore, the findings highlight a significant shortage of empirical research, emphasizing the urgent need for further studies in areas where

literature on evidence-based practices is mostly limited, particularly concerning the ECC and classroom arrangements. Future research should aim to fill these gaps by investigating the impact of these strategies on SVI outcomes in inclusive educational contexts. Additionally, studies that evaluate the effectiveness of collaborative approaches between general and special education teachers are crucial for validating non-research evidence. By addressing these limitations through rigorous empirical research, future studies can provide valuable insights that strengthen expert knowledge and enhance the academic and social inclusion SVI in regular education settings.

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DECLARATIONS OF INTEREST

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REFERENCES

- Agesa, L. (2014). Challenges faced by learners with visual impairments in inclusive setting in Trans-Nzoia County. *Journal of Education and Practice*, (10)5, 185–192.
- Ainscow, M. (2020). Promoting inclusion and equity in education: lessons from international experiences. *Nordic Journal of Studies in Educational Policy*, 6(1), 7–16. <https://doi.org/10.1080/20020317.2020.1729587>
- Bajaj, G. (2019). Revisiting visual impairment. In S. Chennat (Ed.), *Disability and inclusive education*, (pp. 139–156). Springer.
- Berryhill, M. E., & Olson, I. R. (2008). The right parietal lobe is critical for visual working memory. *Neuropsychologia*, 46(7), 1767–1774. <https://doi.org/10.1016/j.neuropsychologia.2008.01.009>
- Blackstone S.W., Luo F., Canchola J., Wilkinson K.M., & Roman-Lantzy C. (2021). Identifying gaps between needs and current practice for children with cortical visual impairment and complex communication needs. *Language, Speech, and Hearing Services in Schools*, 52(2), 612–629. https://doi.org/10.1044/2020_LSHSS-20-00088
- Bruce, S., Ferrell, K., & Luckner, J. L. (2016). Guidelines for the administration of educational programs for students who are deaf/hard of hearing, visually impaired, or deafblind. *Journal of the American Academy of Special Education Professionals*, 47–59. <https://files.eric.ed.gov/fulltext/EJ1129776.pdf>
- Ceralli, G. (2019). *Inclusive education in Senegal: Ten years of experience implementing inclusive education programs in Dakar and Casamance*. Sightsavers Senegal and Humanities and Inclusion.
- Colclasure, B. C., Thoron, A. C., & LaRose, S. E. (2016). Teaching students with disabilities: Visual impairment and blindness. *EDIS*, 2016(6), 1–4. <https://doi.org/10.32473/edis-wc259-2016>
- Cook, B. G., & Cook, S. C. (2013). Unraveling Evidence-Based Practices in Special Education. *The Journal of Special Education*, 47(2), 71–82. <https://doi.org/10.1177/0022466911420877>
- Cook, B. G., & Odom, S. L. (2013). Evidence-based practices and implementation science in special education. *Exceptional Children*, 79(2), 135–144. <https://doi.org/10.1177/001440291307900201>
- Cox, P. R., & Dykes, M. K. (2001). Effective classroom adaptations for students with visual impairments. *TEACHING Exceptional Children*, 33(6), 68–74. <https://doi.org/10.1177/004005990103300609>

- Davis, P. (2003). *Including children with visual impaired impairment in mainstream schools: A practical guide*. David Fulton Publishers.
- DeCarlo, D. K., Woo, S., & Woo, G. C. (2006). Patients with low vision. In W. J. Benjamin & I. M. Borish (Eds.), *Borish's Clinical Refraction* (2nd ed., pp. 1591–1618). Butterworth-Heinemann. <https://doi.org/10.1016/B978-0-7506-7524-6.50041-7>
- Dettmer, P., Thurston, L. P., Knackendoffel, A., & Dyck, N. (2009). *Collaboration, consultation, and teamwork for students with special needs* (6th ed.). Pearson.
- Diasse, M. D., & Kawai, N. (2024). Barriers to curriculum accessibility for students with visual impairment in general education setting: The experience of lower secondary school students in Senegal. *The Curriculum Journal*, 00, 1–16. <https://doi.org/10.1002/curj.269>
- Douglas, G., Grimley, M., Hill, E., Long, R., & Tobin, M. (2002). The use of the NARA for assessing the reading ability of children with low vision. *British Journal of Visual Impairment*, 20(2), 68–75. <https://doi.org/10.1177/026461960202000204>
- Douglas, G., McLinden, M., McCall, S., Pavey, S., Ware, J., & Farrell, A. M. (2011). Access to print literacy for children and young people with visual impairment: findings from a review of literature. *European Journal of Special Needs Education*, 26(1), 25–38. <https://doi.org/10.1080/08856257.2011.543543>
- Ferrell, K. A. (2006). Evidence-based practices for students with visual disabilities. *Communication Disorders Quarterly*, 28(1), 42–48. <https://doi.org/10.1177/15257401060280010701>
- Ferrell, K. A., Bruce, S., & Luckner, J. L. (2014). *Evidence-based practices for students with sensory impairments* (Document No. IC-4). University of Florida.
- Fraser, W. J., & Maguvhe, M. O. (2008). Teaching life sciences to blind and visually impaired learners. *Journal of Biological Education*, 42(2), 84–89. <https://doi.org/10.1080/00219266.2008.9656116>
- Friend, M., & Cook, L. (2017). *Interactions: Collaboration Skills for School Professionals* (8th ed.). Pearson.
- Haakma, I., Janssen, M., & Minnaert, A. (2018). Need support in students with visual impairments: Comparing teacher and student perspectives. *Frontiers in Education*, 2(71), 1-11. <https://doi.org/10.3389/feduc.2017.00071>
- Habulezi, J., Phasha, T. N. (2012). Provision of learning support to learners with visual impairment in Botswana: A case study. *Procedia – Social and Behavioral Sciences*, 69, 1555–1561. <https://doi.org/10.1016/j.sbspro.2012.12.098>
- Hatton, D. D. (2014). Advancing the education of students with visual impairments through evidence-based practices. *International Review of Research in Developmental Disabilities*, 46, 1–22. <https://doi.org/10.1016/B978-0-12-420039-5.00001-0>
- Hill, E., Long, R., Douglas, G., Grimley, M., & Tobin, M. (2002). *Neale Analysis of Reading Ability for Readers with Low Vision: A supplementary manual to aid the testing and interpretation of partially sighted children's reading use the Neale Analysis of Reading Ability (NARA)*. University of Birmingham.
- Hornby, G. (2014). *Inclusive special education: Evidence-based practices for children with special needs and disabilities*. Springer.
- Houchins, D. E., Shippen, M. E., & Murphy, K. M. (2012). Evidence-based professional development considerations along the school-to-prison pipeline. *Teacher Education and Special Education*, 35(4), 271–283. <https://doi.org/10.1177/0888406411412396>
- IDEA (2004). *Individuals with Disabilities Education Improvement Act*, P.L. No. 108–446, 20 U.S.C.
- Johnson-Jones, K. J. (2017). *Educating students with visual impairments in the general education setting* [Unpublished doctoral dissertation]. University of Southern Mississippi. https://aquila.usm.edu/dissertations/1337?utm_source=aquila.usm.edu%2Fdissertations%2F1337&utm_medium=PDF&utm_campaign=PDFCoverPages
- Kapur, R. (2018). *Challenges experienced by visually impaired students in education*. [Unpublished article] https://www.researchgate.net/publication/323833804_Challenges_Experienced_by_Visually_Impaired_Students_in_Education
- Kasebusha, N., & Banda, B. (2021). Teaching strategies for learners with visual impairment: A case study of Mporokoso and Munali secondary schools. *Zambia Interdisciplinary Journal of Education*. 2(1), 71–82. <https://ide.unza.zm/index.php/ZIJE/article/view/686/577>
- Kaul, Y. F., Rosander, K., von Hofsten, C., Brodd, K. S., Holmström, G., & Hellström-Westas, L. (2021). Visual tracking at 4 months in preterm infants predicts 6.5-year cognition and attention. *Pediatric Research*, 92, 1082–1089. <https://doi.org/10.1038/s41390-021-01895-8>
- Kavitha, V., Manumali, M., S., Praveen K. & Heralgi, M., M. (2015). Low vision aid: A ray of hope for irreversible visual loss in the pediatric age group. *Taiwan Journal of Ophthalmology*, 5(2), 63–67. <https://doi.org/10.1016/j.tjo.2015.02.002>
- Kelly, S. M., Smith, D. W. (2011). The impact of assistive technology on the educational performance of students with visual impairments: A synthesis of the research. *Journal of Visual Impairment & Blindness*, 105(2), 73–83. <https://doi.org/10.1177/0145482X1110500205>

- Kızılaslan, A. (2020). Teaching students with visual impairment. In V. R. Nata (Ed.), *Progress in Education*, 63. Nova Science Publishers.
- Klingenberg, O. G., Holkesvik, A. H., Augestad, L. B., & Erdem, E. (2019). Research evidence for mathematics education for students with visual impairment: A systematic review. *Cogent Education*, 6(1). <https://doi.org/10.1080/2331186X.2019.1626322>
- Koehler, K. E., & Picard, K. M. (2024). Making STEM accessible for students with visual impairments: Implications for practice. *TEACHING Exceptional Children*, 0(0). <https://doi.org/10.1177/00400599241231211>
- Lakkala, S., Uusiutu, S., & Määttä, K. (2016). How to make the neighborhood school a school for all? *Journal of Research in Special Educational Needs*, 16(1), 46–56. <https://doi.org/10.1111/1471-3802.12055>
- Lang, A., Edwards, N., & Fleischer, A. (2007). Empty systematic reviews: hidden perils and lessons learned. *Journal of Clinical Epidemiology*, 60(6), 595–597. <https://doi.org/10.1016/j.jclinepi.2007.01.005>
- Le Fanu, G., Schmidt, E., & Virendrakumar, B. (2022). Inclusive education for children with visual impairments in Sub-Saharan Africa: Realizing the promise of the convention on the rights of persons with disabilities. *International Journal of Educational Development*, 91, 102574. <https://doi.org/10.1016/j.ijedudev.2022.102574>
- Lieberman, L. J., Lepore, M., Lepore-Stevens, M., & Ball, L. (2018). Physical education for children with visual impairment or blindness. *Journal of Physical Education, Recreation & Dance*, 90(1), 30–38. <https://doi.org/10.1080/07303084.2018.1535340>
- MacCuspie, P. A. (1996). *Promoting acceptance of children with disabilities: From tolerance to inclusion*. Atlantic Provinces Special Education Authorities.
- Maguvhe, M. (2015). Inclusive education: A transformation and human rights agenda under spotlight in South Africa. *African Journal of Disability*, 4(1), 183. <https://doi.org/10.4102/ajod.v4i1.183>
- Mariga, L., McConkey, R., & Myezwa, H. (2014). *Inclusive education in low-income countries: A resource book for teacher educators, parent trainers and community development workers*. Atlas Alliance and Disability Innovations Africa.
- Mastropieri, M. A., & Scruggs, T. E. (2010). *The inclusive classroom: Strategies for effective differentiated instruction (4th ed.)*. Pearson Education.
- Mdoe, M., B., Mselle, L., T., & Kibusi, S., M. (2024). An integrative review of home care recommendations for women after caesarean section. *Nursing Open*, 11(3), 1–13. <https://doi.org/10.1002/nop2.2145>
- Mitchell, D., & Sutherland, D. (2020). *What really works in special and inclusive education: Using evidence-based teaching strategies (3rd ed.)*. Routledge.
- Miyauchi, H. (2020). A systematic review on inclusive education of students with visual impairment. *Education in Science*, 10(11), 346. <https://doi.org/10.3390/educsci10110346>
- Morelle, M., & Tabane, R. (2019). Challenges experienced by learners with visual impairments in South African township mainstream primary schools. *South African Journal of Education*, 39(3), 1–6. <https://doi.org/10.15700/saje.v39n3a1615>
- Mustafa, A., Opoku, M. P., & Belbaseb, S. (2022). Using tactile imagery to teach geometry to students with visual impairments in The United Arab Emirates. *Research in Developmental Disabilities*, 129, 104309. <https://doi.org/10.1016/j.ridd.2022.104309>
- Mwakyeya, B. M. (2013). *Teaching students with visual impairments in inclusive classrooms: A case study of one secondary school in Tanzania*. [unpublished master's thesis, University of Oslo] <https://www.duo.uio.no/bitstream/handle/10852/36642/1/MasterxThesis.pdf>
- Negash, K. H., & Gasa, V. (2022). Academic barriers that prevent the inclusion of learners with visual impairment in Ethiopian mainstream schools. *SAGE Open*, 12(2), 1–12. <https://doi.org/10.1177/21582440221089934>
- Ralejoe, M. (2021). A Study to Understand the Inclusion of Learners with and without Visual Impairment in a Secondary School in Lesotho. *South African Journal of Education*, 41(1) 1–12. <https://doi.org/10.15700/saje.v41n1a1746>
- Rytivaara, A., & Kershner, R. (2012). Co-teaching as a context for teachers' professional learning and joint knowledge construction. *Teaching and Teacher Education*, 28(7), 999–1008. <https://doi.org/10.1016/j.tate.2012.05.006>
- Salisbury, R. (2008). *Teaching students with visual impairment: A guide to making the school curriculum accessible*. Routledge.
- Sapp, W., & Hatlen, P. (2010). The Expanded Core Curriculum: Where we have been, where we are going, and how we can get there. *Journal of Visual Impairment & Blindness*, 104(6), 338–348. <https://doi.org/10.1177/0145482X1010400604>
- Schlosser, R. W., & Sigafoos, J. (2008). Identifying 'evidence-based practice' versus 'empirically supported treatment.' *Evidence-Based Communication Assessment and Intervention*, 2(2), 61–62. <https://doi.org/10.1080/17489530802308924>
- Spungin, S. J. (2002). *When you have a visually impaired student in your classroom: A guide for teachers*. New York: AFB Press.
- Teke, D., & Sozibilir, M. (2019). Teaching energy in living systems to a blind student in an inclusive classroom environment. *Chemistry Education Research and Practice*, 20(4), 890–901. <https://doi.org/10.1039/C9RP00002J>

- Torres, C., Farley, C. A., & Cook, B. G. (2012). A special educator's guide to successfully implementing evidence-based practices. *Teaching Exceptional Children*, 45(1), 64–73. <https://doi.org/10.1177/004005991204500109>
- Tseeke, M. (2021). Teachers' perceived self-efficacy in responding to the needs of learners with visual impairment in Lesotho. *South African Journal of Education*, 41(Suppl. 2), S1–S12. <https://doi.org/10.15700/saje.v41ns 2a1920>
- UNESCO. (2009). *Policy guidelines on inclusion in education*. Paris: United Nations Educational, Scientific and Cultural Organization.
- UNESCO. (2020). *Education of children with visual impairments in Sub-Saharan Africa: Challenges and opportunities*. United Nations Educational, Scientific and Cultural Organization.
- United Nations. (2006). *Convention on the rights of persons with disabilities and optional protocol*. United Nations
- Venianaki, A., & Zervakis, S. (2015). Collaboration practices between special education teachers and mainstream teachers in secondary education. *Journal of Education and Social Policy*, 2(6), 42–46.
- Walther-Thomas, C., Korinek, L., MacLaughlin, V., & Williams, B. (2000). *Collaboration for inclusive education: Developing successful programs*. Allyn and Bacon.
- Wolffe, K. (2000). Making it! Successful transition competencies for youth with visual disabilities. *See/Hear*, 5(2), 19–24.
- Wolffe, K. E., Sacks, S. Z., Corn, A. L., Erin, J. N., Huebner, K. M., & Lewis, S. (2002). Teachers of Students with Visual Impairments: What are they Teaching? *Journal of Visual Impairment & Blindness*, 96(5), 293–304. <https://doi.org/10.1177/0145482X0209600502>
- Wolffe, K., & Kelly, S. M. (2011). Instruction in areas of the Expanded Core Curriculum linked to transition outcomes for students with visual impairments. *Journal of Visual Impairment & Blindness*, 105(6), 340–349. <https://doi.org/10.1177/0145482X1110500605>
- WHO. (2001). *International classification of functioning, disability and health for children and youth (ICF-CY)*. World Health Organization.
- WHO. (2021). *Evidence, policy, impact: WHO guide for evidence-informed decision-making*. World Health Organization.
- Yihun, S. G., & Belay, M. A. (2020). The challenges and opportunities of visually impaired students in inclusive education: The case of Bedlu. *Journal of Pedagogical Research*, 4(2), 112–124. <https://doi.org/10.33902/JPR.2020060437>